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THE JOHN CRERAR
DEC 18 1951

Contractors and Engineers Monthly

Vol. 48, No. 12 DECEMBER, 1951 $4 a Year, 50 Cents a Copy

Covering the Field

• Engineer Leadership
Engineers helped lead the material progress of this nation; ASCE head C. S. Proctor challenges them to help lead in world affairs too. Page 3.

• Road Repair Radioized
Snow-removal and routine maintenance equipment is being "radioized" in Montana; the State finds that better communications mean less expensive work. Page 5.

• Air Base Enlarged
Tyndall Air Force Base, Fla., has to take jets now, so it needed enlarging. Two 8,000-foot concrete runways, a taxiway, and an apron will help. Page 12.

• Cuts Mowing Costs
A new chemical promises to inhibit grass growth. Roadside men, turn to page 18 for news of maleic hydrazide tests.

• Building Construction
The world's largest underground garage in Los Angeles has sidewalls of precast concrete sections in drilled caissons. Page 20 carries pix as well.
Quick welding raised a Columbus, Ind., factory in 70 days. Steel was fabbed on site; erected by a new method. Page 62.

• Bridge Reconstructed
A new concrete pile at each bent widened a 25-year-old bridge over the Chowan River, N. C. Story and pix, page 26.

• Tricky Canal
Varying bottom widths were a snag, so unorthodox equipment trimmed and lined part of a main canal near Coulee City, Wash. Read how, on page 33.

• Highway Widened
Two pages of pictures show how Missouri is widening the bad sections of its 25-year-old concrete system. Pages 40-41.

• Plant-Mix Over Concrete
A 3-ton pugmill plant on a siding supplied asphalt for the 8.88-mile improvement of U. S. 1 in Virginia. Widening was included. Story appears on page 45.

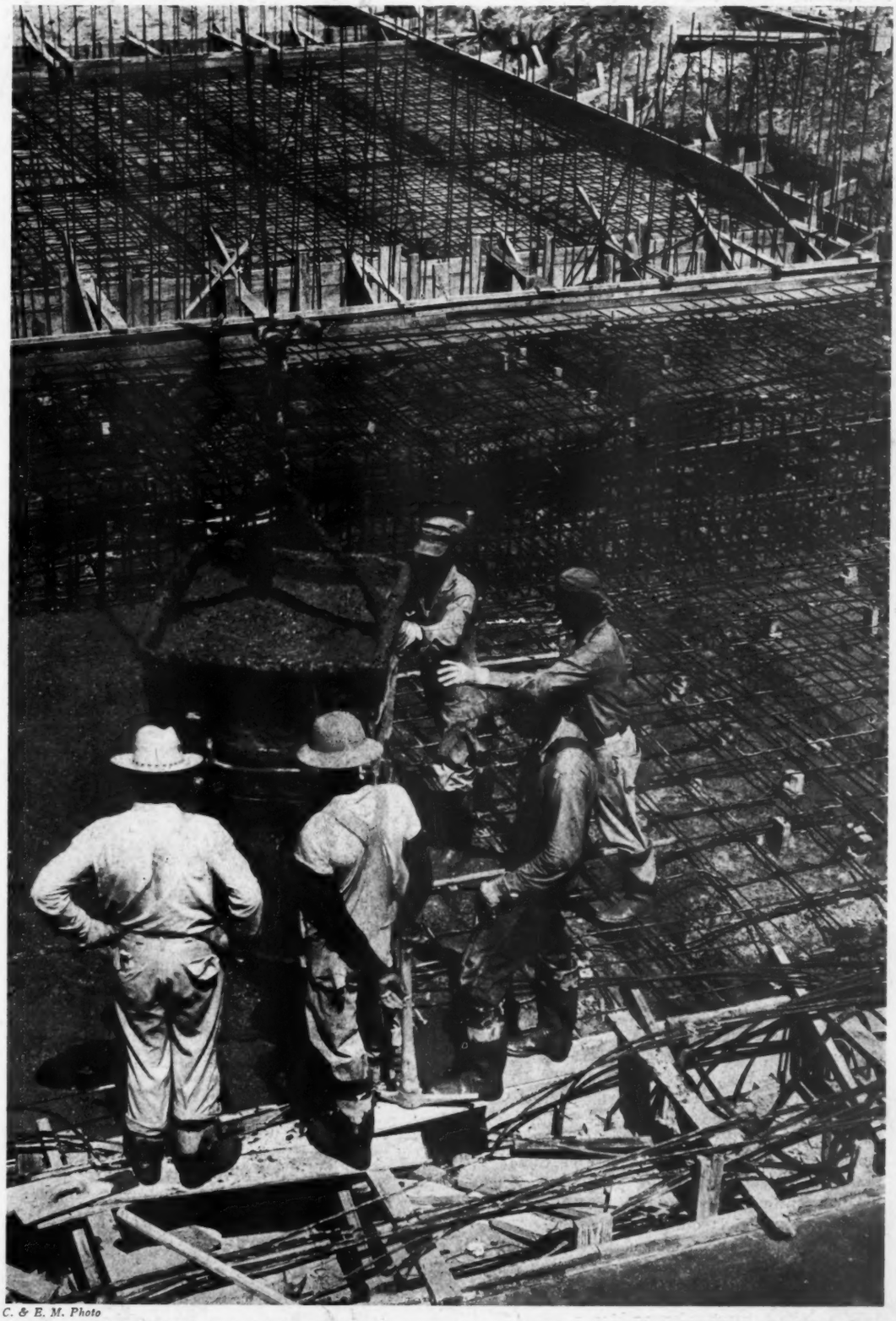
• Meeting Reports
The ASCE Fall Meeting included a general session on civil-military liaison. Page 51 also covers awards, elections, etc.
AASHO delegates, in Omaha, Nebr., concentrated on the critical situation caused by the steel shortage. Page 55.

• Economics of Safety
The President of Volpe Construction Co. covers the how and cost-saving why of safety programs, on page 66. He gets down to cases, too.

• Water Works
Dallas, Texas, has double the water it had, thanks to the new Elm Fork plant. The State Water Department and 9 private contractors rushed its completion. Page 70.

• Oahe Dam
It's the second largest in the Pick-Sloan plan for the Missouri Valley development. Story and pix on page 90.

(You will find "In This Issue" on page 4)



C. & E. M. Photo

Concrete is dumped to the floor of a filter bed at the new Elm Fork water purification plant the Dallas Water Department is building. James C. Williams is one of the nine contractors rushing the job. See page 70.

NEWS AND VIEWS

of the construction industry at home and abroad — materials outlook for the first quarter of next year.

Steel, copper, and aluminum news has pretty well hogged this page all during 1951, so we might as well stick with the trend to the last. **Here's the materials situation for the first quarter of next year** as DPA and NPA officials sketched it in a Washington meeting with industry editors.

Demand, demand, demand. You can't appreciate our problems until you grasp the total first-quarter demand for controlled materials, they said—about 156 per cent of supply for carbon steel, over 200 for structural steel, 160 for stainless, 180 for plate, and so on . . . The military alone asked for a direct take of 13 per cent of the supply of carbon steel, 35 per cent of alloy steel, 40 per cent of brass-mill products, and 40 per cent of aluminum production . . . The result was that **no claimant agency could possibly get all it asked for — not even the military,** whose stated needs were scaled down to what the officials called its real needs, what it could gainfully use . . . Moreover, even if there had been enough controlled materials to go around, officials argued, **there wouldn't have been enough construction components to support the huge programs** outlined by claimant agencies—programs in many cases larger than those undertaken in the first quarter of 1950 . . . Allotments finally arrived at were in all cases compromises between demand and supply, the deferable and the nondeferable.

What about those allotments? Well, the first-quarter material **alloments for construction as a whole should support a yearly industry volume of $29 billion,** they said . . . The allotment for **schools** should meet all needs for elementary and secondary-school programs and about half the needs for libraries, museums, colleges, etc. . . . **Industrial and commercial buildings** already 20 per cent complete should, with their allotment, be able to continue during the first quarter, though there will be no new starts to speak of . . . Ditto **hospitals.**

What about highways and the cut from some 250,000 tons of steel (fourth quarter) to 200,000 tons (first quarter)? Not the cut it seems, said officials, for about 30,000 tons of the fourth-quarter allotment went directly to small users, while for the first quarter, 30,000 tons has been set aside, over and above the allotment, for self-certification orders. However, **the structural-steel cut is real, and drastic,** they admitted. It had to be . . . As for the 3,000,000 tons to the auto industry, it does not deprive the highway industry of anything, they said. The auto take is sheet metal and wouldn't help highways or buildings.

Housing? Does the 800,000 figure for starts in 1952 still stand? Well, that raises a critical problem, said officials — copper! **There will probably be enough other materials for a housing-as-usual program, but there almost certainly will not be enough copper** for the requisite plumbing, brass goods, and so forth. For while steel and aluminum production is expanding (steel you know about; aluminum is scheduled to be up 60 per cent from 1950 by the end of 1952), copper, like structural steel, is standing still. True, projects are afoot in the U. S. and South America to increase the output of copper ore, but the domestic deposits are low-grade and processing will be tough. Meanwhile the military take of copper is mounting fast. **The real copper squeeze will come in the spring of '52, they said, and will affect all building construction,** not just housing. **Producers of building materials** are already feeling the squeeze, for though their first-quarter allotments of steel will be up from the fourth quarter, copper will be **down.**

What about construction-machinery output? Roughly the same as for the last quarter, said officials, though less alloy steel forthcoming. Distribution is the real worry here, they said. (The Construction Machinery Industry Advisory Committee has asked the NPA to tighten the criteria for the issuance of DO-orders to assure construction machinery for only the most critical requirements.)

On the train coming back from the Washington conference, we found ourselves in a mood of unusual benignity. "Poor chaps, those alphabetical administrators," we mused. "They have their problems too. Can't say they aren't trying." From there it was no leap at all into a mood of inspired prophecy. "It's quite obvious," we told the passing scenery, "that opportunities for heroism in 1952 will be rife, whether in standardizing and simplifying designs so as to save steel, or in leading scrap drives." Then we lost ourselves in a happy day dream. Single-handed we had been the one to dispense with copper and devise a plumbing fixture out of, say, aluminum! Crowds shrieked their approval. Ticker tape tickled our ears and all but hid the Congressional Medal on our breast.

A backward look is always appropriate in December, and here we take one at the aftermath of perhaps the year's worst disaster—the Missouri floods. Gas tanks which floated off their foundations in the Owens-Corning plant at Kansas City are replaced by Lorain Moto-Cranes belonging to Belger Cartage Service, Kansas City.

And now a backward glance at a couple of jobs C&E Monthly reported in 1951. Remember the Republic Bank Building job in Dallas (September, page 81)? Well, the photo at left shows a neat public-relations stunt on the site—post cards for visitors, supplied and mailed free by the bank. And remember the Delaware Memorial Bridge story (October, page 43)? Well, the two men shaking hands at the bridge dedication ceremonies are R. E. DeSimone (left) Executive Vice President of Merritt-Chapman & Scott Corp., and Frank K. McDanel, President of American Bridge Co.—foundation and superstructure contractors, respectively.

Engineer Must Lead In World of Today

No One Can More Effectively Refute "Statism" or Battle the Canker of Intolerance Than The Engineer-Citizen-Leader

By
CARLTON S. PROCTOR, President,
American Society of Civil Engineers

Carlton S. Proctor, New York consulting engineer, was elected this fall to the presidency of the oldest national organization of engineers, the American Society of Civil Engineers. In his inaugural address he posed the following challenge to engineers everywhere—a challenge peculiarly fitting as the Society enters 1952, its Centennial year.

• IN this year of the full maturity of engineering, we look back on 100 years during which our profession has played its full part in the development of our country. We have held decisive roles in every war. We have been pioneer, leader, and inventor in all fields of production and national development for the improved living standard and greater comfort of our fellow man. And, particularly in recent years, we have accepted responsibilities and leadership in the solution of non-technical problems in public welfare.

When the help of the Engineer was sorely needed in our hasty rearmament in preparation for our participation in World War II, the Engineers National Defense Board was created, whereby each of the constituent societies of the Engineers Joint Council drafted its selected members for service in the preparation of study reports, codes, and research conclusions that proved invaluable to our war effort and to the balance maintained in civilian production.

When the now fortunately forgotten Morgenthau Plan, for the reduction of all of Germany to a strictly agrarian state, was publicly announced. EJC challenged our State Department and demanded the opportunity to prepare an intelligent program for the industrial demobilization of aggressor states. As a result, the studies and reports of the National Engineers Committee of EJC on the industrial demobilization of Germany and Japan were employed by the allies for a far more rational solution to a problem that would otherwise have come home to damn us in our present strained relationship with Russia. These reports could only have been prepared by men of broad technical knowledge and experience, whose training in thorough analytical thinking inhibited their capacity to compromise with internal or local political considerations of the moment. Wide public acceptance of these works, both here and abroad, demonstrated the public's confidence in applied engineering judgment.

Civilization is now faced with another false politico-economic ideology, far more insidious and destructive than a Morgenthau Plan or any that has so far challenged our progress. Of course I refer to that philosophy which today appears to permeate much political thinking throughout all Europe and the Western Hemisphere. This is the philosophy of "something for nothing"; that only a sucker works any harder than he has to; that the modern machine with its straight-line production has eliminated the need for industrious work; that ideas are now a natural resource; that profit to the investor, and reward to experience gained through hard work and application, to management, and to creative effort are little short of immoral and can be taxed out of existence without destroying our economy. Far too many of us accept the false thesis that moral lassitude in public office, public subsidy of indigence, and tax-supported boondoggling; the trading of the dignity and integrity of the individual for a superstate; and the sacrifice of our priceless national heritage of morality, the dignity of work, and the essential place of God in our daily life are but a fair price to pay for the new, abundant, indolent life.

Statism, in its insidious usurpation of the rights, liberties, and incentives of the individual, may in its end result be more permanently destructive to human rights than Communism, for the more subtle reason that statism is being approached through the democratic process, whereas Communism has only been enforced on any people through a police state supporting a ruthless dictatorship.

Even among the most intelligent it has become the style to blame all this on the Government administration in

(Continued on page 82)

Wyoming constructs

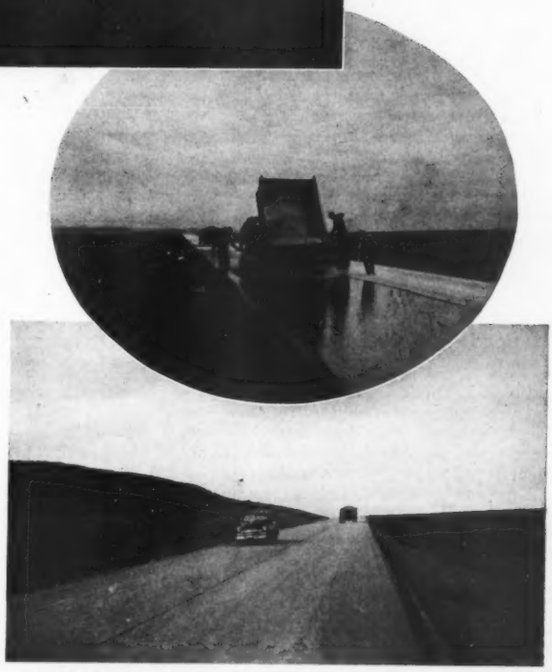
21-mile State Highway project

with TEXACO ASPHALT PRODUCTS

The Wyoming State Highway Department employed flexible-type construction throughout, in building this section of U. S. 85, one of its main routes. For sub-base, the State used 8 inches of gravel, on which was laid a 6-inch base of crushed gravel.

Texaco Asphalt Cement and Cutback Asphalts then were used to provide the highway with a durable, waterproof wearing surface. After priming the base with MC-1 Cutback, a 2-inch compacted thickness of resilient, heavy-duty Texaco Asphaltic Concrete was laid, using a 120-150 penetration asphalt in the mix. To seal the pavement, RC-4 Cutback was applied, covered with stone chips and rolled.

Whether they were constructing new highways or maintaining existing routes, America's road builders have been relying on the dependable performance of Texaco Asphalt products for over 45 years. Texaco Asphalt Cements, Cutback Asphalts and Slow-curing Asphaltic Oils perform a well-rounded service for the road builder. They include a product for every purpose—heavy-duty paving, low-cost surfacing, surface-treatment and patching. For useful information on the variety of road and street improvement types possible with Texaco Asphalt products, write for booklets, "Texaco Asphalt Paving—Plant-mixed Types" and "Road Building with Texaco Asphalt by the Pressure Distributor Method."



(Top) Laying hot-mix Texaco Asphaltic Concrete wearing surface over crushed gravel base on U. S. 85 between Lusk and Newcastle, Wyo. . . . (center) Seal coat of RC-4 Cutback Asphalt being covered with stone chips . . . (bottom) Completed pavement on U. S. 85. The Summit Construction Company of Rapid City, S.D., was the contractor.

THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd Street, New York 17
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TEXACO

TEXACO ASPHALT

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William H. Quirk, Eastern Editor
Michael A. Spronck, Catherine J. Hearn, Pauline E. Putnam
Associate Editors
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Edgar J. Buttenheim, President
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Hannah Duke Henn, Circulation Manager

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The Engineer as a Professional Man

Engineers frequently ask, "Why don't laymen accord us the professional prestige they give so readily to doctors and lawyers?" If one answer is more correct than another, we would say that it is because engineers often lack social consciousness—a feeling of responsibility to their community and government, outside of their own profession and the work it is doing.

Dwight Bray, Chief Engineer of the Kentucky Department of Highways, brought this out in a talk before the Kentucky Society of Professional Engineers last summer. The engineer is just a bit self-satisfied with his profession, his work, and his associates, Mr. Bray said. We'll buy that, and go along with his idea that maybe there aren't enough engineers as members of local civic organizations—chambers of commerce, Rotary, Lions, Kiwanis, and other service clubs. These groups deal with matters of concern to the engineer, on both local and national levels. If he wants professional prestige, he will have to broaden his scope and take a greater part in civic affairs.

Designing and constructing public buildings is not enough. We have to see that they are properly used, managed by capable and honest officeholders. We have to realize that public education is as important to the moral health of our community as the sewage system is to its physical health. And that libraries, museums, parks, and playgrounds contribute to the cultural growth of our society.

Too often the engineer is a stranger to all other professions and activities. His work is his horizon and, for him, it is sufficient. He is rarely a mayor of a city, a governor, a representative in the state legislature, or a member of Congress. He is rarely a leader in the cultural activities of a community.

We suggest that in his preoccupation with professional responsibilities and physical improvement for this country—dams, bridges, highways, better water supplies—the engineer has deprived himself and his community of other equally rewarding types of service. The nation and the world today need the best from all their citizens. The engineer has much to give. When he recognizes his larger and broader responsibilities to society and fulfills them to the best of his ability, he will gain the acceptance as a professional man and the prestige he deserves.

For an inspiring discussion of the engineer's role in the world today, we recommend the article on page 3—a resume of the inaugural address by Carlton Proctor, new President of the American Society of Civil Engineers.

A Bolt From the Wild Blue Yonder

Muddled thinking and confusing statements out of Washington are commonplace enough these days. But when Secretary of the Air Force Thomas K. Finletter voices opposition to the use of American construction companies in building air bases abroad, it is enough to startle the most blase observer of the American scene.

The Air Force Secretary sounded off thus, according to the press, during his recent inspection of Air Force facilities in the North Atlantic Treaty Organization area. Paradoxically, on his return to Washington, Secretary Finletter expressed displeasure at the slow rate at which air bases have been acquired and constructed both in the continental United States and abroad. If progress in air-base construction is not satisfactory, better results can hardly be expected from turning the work over to native companies in the NATO area.

The Secretary's statement aroused the ire of the Construction Men's Association, which represents some 10,000 American craftsmen and technicians working on all kinds of projects in foreign countries for American construction firms. The CMA pointed out that, contrary to Secretary Finletter, top Air Force men preferred American construction contractors to handle this work because they could do it twice as fast as any other group and at half the cost.

Referring to the 183,000 workers currently engaged on 100 projects around the globe, the Association declared that the Secretary would "not only turn his back on American craftsmen whose taxes help pay for these enormous projects, but would ignore the judgment of every nation around the world that has large-scale construction to do."

In seeking an explanation of the Cabinet member's attitude, the Construction Men's Association charged that Secretary Finletter "is dangerously unrealistic and impractical in his approach to the problem. Or could it be that he has let the cat out of the bag—that the emergency so consistently proclaimed by the administration is not nearly so threatening as they would have the public believe? There would seem to be no other reason for the fact that he so lightly accepts the prospect of urgent air-base construction taking twice as long as necessary."

In Refutation And Clarification

To the Editors,
CONTRACTORS AND ENGINEERS MONTHLY:

During my forty-three years of service with the State of New York I have never written a letter to a magazine in support of my designs or my personal professional ability. It has never been necessary. When, however, you refer in a deprecatory manner to whole groups of men other than myself, it is necessary for me to speak. I refer to your editorial in your last issue. ["Public Works With Private Talent", October, 1951, page 4.]

The insidious influence of statements such as you have made, if left unanswered, eat at the very vitals of honor and integrity which go to make up the core of professional state service. Over 95 per cent of the organization in the office of the Deputy Chief Engineer in charge of the design of structures, which includes bridges, in the Department of Public Works of the State of New York are university or college graduates. These men belong to professional societies of the highest standing. They are capable and competent men with years of progressive service in the advancement of bridge design. They are licensed professional engineers recognized by the University of the State of New York.

Because of the vast amount of work created by the Thruway and other urban highways confronting the Department of Public Works, portions of the projects have been extended to outside groups of engineers to produce contract plans in large volume. In practically every instance there has been no release of authority by this Department, nor was there any thought of such action. The designs being progressed are based on the modern designs developed by the office of the Deputy Chief Engineer over the past quarter of a century. Many of our designs have been copied widely by consulting or contracting engineers. Many of the staff of these organizations are men recruited from our own group as well as other states. These organizations fluctuate in size, depending on the demand for their services. In doing this they are able to recognize higher salary rates for the services they require.

Your exuberance is offensive to the large professional group who have none of the characteristics you outline. These men do not reflect political expediency of any party. Their service in New York State represents the growth of civil service in the state. The result is that more than 50 per cent of these highly competent men have services of more than a quarter of a century.

It is in my opinion not fair to the majority of that large group of men who are in private practice to endow them with such ridiculous attributes as your editorial attributes to them. I naturally am acquainted with many engineers in private work and, in fact, some of my personal friends are in private practice. They are too fine to seek employment under any such banner as you so crudely wave.

All the men in my office want to sign this letter, but that would be asking too much space of you. The only request I make is that you give this communication the same prominence that your editorial obtained.

Very truly yours,

E. W. Wendell,
Deputy Chief Engineer
State of New York
Department of Public Works
Albany, N. Y.

Editor's Note: It was certainly not our intent in our October editorial to disparage in any way the engineering profession as a whole, or that large group of highway engineers whose professional competence, integrity, and dedication to public service are unquestioned. Rather, our remarks were directed against those cases which, while the exception to the rule, do exist, in which politics, the selfish interests of pressure groups, and professional incompetence result in decisions detrimental to the public interest, and—since some of the people involved hold the title "engineer"—to the engineering profession and those engineers who are doing a good job.

It should go without saying that we subscribe wholeheartedly to Mr. Wendell's statement about the engineering profession, and are glad to publish his letter here to clear up any possible misunderstanding about our position.

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Monday morning's catch on the Ritchie State Highway in Maryland—and from only half a mile of it, too. Keeping the highways clean and free of trash is just one of the State Roads Commission's jobs, but it costs the State of Maryland over $1,000 a week. Litter-bugs please note.

Montana Uses Radio For Highway Repair

Snow Removal and Routine Maintenance Activities Expedited As Radio Network Covers State

Montana State Highway Commission Photo

Montana maintenance isn't all plains work as this picture of the modern Flint Creek Hill highway indicates.

• RADIO, one of the most effective communications media known to man, is now serving the Montana State Highway Commission. The statewide network, started back in 1949, was completed in 1951, and is already proving invaluable for snow removal and general maintenance.

The first $40,000 appropriation for Motorola equipment was made in 1949, when the western part of the state was covered. In 1950 another $50,000 was budgeted for central and southeast Montana, and the 1951 allotment of $40,000 finished the coverage. Today 30 pieces of maintenance and snow-removal equipment are "radioized", along with 10 supervisors' cars. The transmitters and relay stations are in, but it is expected that more two-way sets may be installed in the future.

According to State Highway Engineer Troy Carmichael, it is about time the system was in. Montana, third-largest state in the nation, has fewer than 4 people per square mile in its 147,138-square-mile area. Some 5,432 miles of state highways traverse that territory. All are kept open in summer, and 5,338 miles were maintained in usable shape last winter. That is an improvement from 10 years ago, when less than 5,000 miles were maintained in winter.

Probably in no other state in the nation does highway economy mean as much as it does in Montana. Funds are scarce, and highway demand is high. The Federal government participates in quite a bit of Montana's highway program, both through routine Federal Aid and through forest-road appropriations, but it is always touch and go whether or not the few people in the state will be able to match Federal money.

For that reason, better communications, more highly mechanized maintenance, and better production per man-hour are now being emphasized.

Carmichael Changes Policy

The installation of radio started before Carmichael took office in May of 1951, and long before he stepped in, Montana had some crackerjack maintenance men. As a matter of fact, Carmichael fired only 4 men out of 1,250 in the entire department and hired 2 men, both of whom had had previous extensive experience in responsible positions on the staff. Maintenance policies had already been generally established by men like big Ray Percy, for many years Engineer of Maintenance and now a district engineer at Missoula. But somehow the line of planning hadn't quite jelled, and how it got jelled is a story in itself.

Carmichael, a big 6-footer with a rawboned frame, white hair, and a face so red he'd give a heart specialist the willies, arrived in Helena on Thursday to take over the job of state highway engineer the following Monday. He had three days, he figured, to look the system over and see what he'd bought. He got a car and started out.

The month was May, and it was a wet May. About 60 miles out of Helena, on a transcontinental highway, Carmichael found a section about ¼ mile long in such bad shape that the pavement had simply disintegrated. Automobiles were stuck, and state equipment was trying to get as many through as it could.

By the time he got back to take over the new job, he knew precisely where and how to start.

"Why isn't that road being patched?" he asked maintenance men.

They answered, "It isn't time, Mister Carmichael. Oiling season doesn't begin until June 1."

Carmichael can use either soft or hard language on occasion, and this time he turned loose a flood of indigoed oratory which would have done justice to a mule skinner in 1915. When he finished he said, "As of now, the oiling season begins January 1 and continues through December 31."

Instead of not filling holes at all, or filling them with gravel at best, Carmichael's maintenance men were urged to junk traditional thinking and get to work. Probing around, he discovered that Fred Wells and Ray Spurzem up at Kalispell had regularly been patching with premix all winter long. They had even made a study of the thing, which showed that winter

(*Continued on next page*)

What Goodyear is doing about the Highway Crisis

—*in the public interest—and yours!*

In behalf of the modern highway system that this country needs so desperately, Goodyear is running two-page, full-color advertisements like these in the Saturday Evening Post and Collier's—

Another reason why it pays always to BUY and SPECIFY

GOODYEAR

THE GREATEST NAME IN RUBBER

Montana Uses Radio For Highway Repair

(*Continued from preceding page*)

patches in dry holes stayed in place with a loss of only 10 per cent of material. Wet holes lost 20 per cent, and water-soaked holes often lost 50 per cent. Gravel patches whipped out in a week. This was news and Carmichael made the most of it. Winter maintenance with premix is now a firmly established policy, and whenever the roads are sufficiently open in winter to develop holes, maintenance men patch them with asphalt.

According to Carmichael, his maintenance engineers are setting to enthusiastically. E. B. Martin, Maintenance Engineer, was formerly Construction Engineer for the Department. His assistant, W. E. Bawden, knows Montana maintenance like a book. Division maintenance engineers now are directly responsible to Martin, instead of to the division construction departments, and the program is working with new vigor.

C. & E. M. Photo

A Case tractor and mower do some late-fall weed-control work near Helena, Mont.

Bituminous Reconstruction

Each year, maintenance forces rebuild or repair some parts of the huge mileage of surface-oiled and road-mixed highways which show a tendency to go to pieces. It is not a new practice, but in recent months it has reached a high degree of mechanization. At first it was called tight-blading, then the terminology was changed to light road-mix retread, and now it is known as a honing operation.

The section for treatment is first patched with premixed bituminous-treated aggregate, to raise subsided sections and correct irregularities. Untreated mineral aggregate, preferably 100 per cent passing the ⅝-inch screen, is then spread 250 to 400 cubic yards per mile, depending on the condition of the original mat surface. It is windrowed, if possible, on the shoulder at the edge of the oiled mat.

The roadway is then swept clean of all dust or other foreign matter, and a pressure distributor applies either MC or SC-type oil half-width to the side adjacent to the windrowed aggregate. The rate of application varies according to the condition of the bituminous surface. If the mat is cracked and visibly porous, the rate is increased. The rate is generally from 18 to 28 gallons per cubic yard of material in the windrow.

Immediately following the first application, motor graders push the windrowed aggregate across the freshly oiled section. Sufficient aggregate is allowed to remain on the oiled section to blot excessive oil. The operation is then repeated by distributing asphalt across the remaining half. Graders follow this machine, blading the aggregate across the roadway. Maintenance men have found that it is always desirable to power-broom the shoulder which held the windrow originally, in order to get all the loose, dry aggregate into the act. Brooming usually follows the first pass by the motor grader.

The material is then mixed out continuously. Pressure is applied to the grader cutting blades almost to the point where the old mat won't take it. This serves to cut off all high spots and corrugations, and to recover all bitumen from the surface under treatment. As blading and processing continue, it is usually necessary to add more bitumen to the aggregate.

When a thorough and intimate mix has been made, the windrow is laid from the quarter point to the edge of the mat. A 6-ton tandem roller is used during the laydown, and usually another rolling is made the day after the material is laid. Montana's expe-

(*Continued on next page*)

PAYLOADERS ON RUBBER

Get the Job Done FAST....

This big 1½ yd. HM PAYLOADER with its combination of large pneumatic tires and 4-wheel drive gives you fast-action traction on all kinds of footing — on sand, stone, snow, clay or mud. It gives you crawler-like traction at far less maintenance expense, PLUS speed when you want it and the ability to work on pavements and to travel over streets and highways at 16 m.p.h.

This PAYLOADER also gives you easy operation and maneuvering speed with its power-boosted steering and full-reversing transmission having four speeds in reverse as well as forward. Once you see the Model HM in action you'll know why hundreds of contractors are its enthusiastic owners and boosters. Full information on this 1½ cu. yd. model and other size PAYLOADERS is yours for the asking. The Frank G. Hough Co., 762 Sunnyside Avenue, Libertyville, Illinois.

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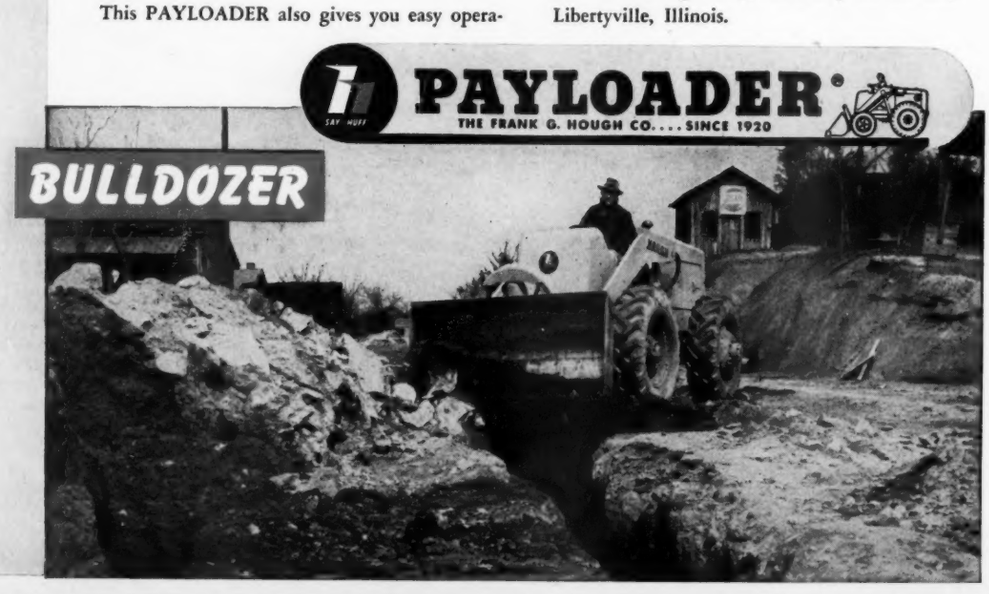


Yours for the Asking

Further information or descriptive literature can be secured from any advertisers in this issue of CONTRACTORS AND ENGINEERS MONTHLY. Just write name of manufacturer and product of interest to you on the extra line provided on the post card facing page 16, fill in your own name and industry connection, mail to us and we'll do the rest.

CONTRACTORS AND ENGINEERS MONTHLY

470 Fourth Avenue New York 16, N.Y.

Montana State Highway Commission Photo

A Snogo works ahead of a light plow on U. S. 10 in Montana's Lookout Pass, where an average 560 inches of snow fall each year.

rience with this process indicates that it is best wherever possible to complete the mixing and laying in one day. The cost of the treatment varies from $1,500 to $2,000 a mile, and it decreases maintenance costs about 40 to 70 per cent. The period of minimum estimated maintenance over these sections advances from 3 to 5 years with the treatment.

Asphalt Tanks Save Money

Another real money saver is a system of electrically heated road-oil storage tanks in the 11 maintenance districts (Butte, Great Falls, Billings, Wolf Point, Missoula, Kalispell, Havre, Miles City, Lewiston, Bozeman, and Glendive). Enormous savings, which will be detailed a bit farther on, have been realized when the new method is compared to the old steam method.

A typical setup is located at Missoula, where two 12,000-gallon vertical tanks are mounted on a platform 7 feet above ground level, supported by 3 bents carrying salvaged streetcar rails and an insulated 2-inch board floor. Tanks are insulated with 4 inches of rock wool on the sides, and 8 inches on top. The insulation is in turn covered by heavy asphaltic felt material. Both insulation and roofing material are held in place with aluminum-sheet covering.

The outlets for oil delivery are 3-inch pipes at 3 different levels through one manifold. This system gives access to the hottest oil in the tank. All outlets are gravity-feed, and are arranged to keep pipes open and clean when not in use. Unstopping frozen asphalt lines is always one of the major causes of fire, so that danger has been eliminated.

Heating elements consist of two 5-kw 220-volt 3-wire single-phase straight tubular heaters. They are installed in a 3-inch pipe housing

(Concluded on next page)

FOR MORE ON **LORAINS** TURN THE PAGE

CONSOLIDATED FREIGHTWAYS INC.
PORTLAND 8, OREGON
March 5, 1951
Fuller Manufacturing Company
Kalamazoo, Michigan
Gentlemen:
We feel that you [illegible] in our experience with your transmission oil filters.
Before we began to install your transmission oil filters on our large units, extensive tests were made to determine that the filter did actually [illegible] to transmission gears and bearings.
In one of a series of tests we conducted as follows: A sample of oil was taken from a 4B86 transmission, the oil having accumulated 23,198 miles. A filter was then installed, and the same oil continued to run for another 33,603 miles, at which time a sample was again taken. Laboratory analysis showed that the oil that had accumulated the higher mileage, was much less contaminated with foreign material than when the filter was installed. With such laboratory proof at hand, it is our conclusion that the use of transmission oil filters should materially extend the life of transmission gears and bearings.
Very truly yours,
Superintendent of Maintenance
"With such laboratory proof at hand, it is our conclusion that the use of transmission oil filters should materially extend the life of transmission gears and bearings."
Superintendent of Maintenance
FREIGHTWAYS
FREIGHTWAYS

Consolidated Freightways, Portland, Oregon, *road-tested* Transmission Gear Oil Filters before installing them on all unit and auxiliary transmissions in their fleet. And here is what the road-test, combined with laboratory tests, *proved:*

On one test, transmission gear oil in a Fuller 4B86 Transmission was sampled after 23,198 miles of service when the Fuller Transmission Gear Oil Filter was installed . . . 33,603 miles later, the same oil was again sampled and "laboratory analysis proved that the oil that had accumulated the higher mileage, was much less contaminated with foreign material than when the filter was installed."

That's why Mr. Ogden is enthusiastic about filters for transmission gear oil. He has proof that here is a way to prolong the life of bushings and bearings.

Protect your gears and bearings

for only $6.95*

*List price subject to change without notice

Fuller TRANSMISSION GEAR OIL FILTER ®

In the Fuller Transmission Gear Oil Filter, normal pressure of rotating gears forces the oil through a cleansing filter and returns it to the gear box. Filter element is replaceable. Unit quickly installed on Fuller Transmissions and most other makes over power take-off opening. And, you pay only $6.95 List* for a Fuller Transmission Gear Oil Filter to protect you against unnecessary down-time and resultant expense.

FULLER MANUFACTURING COMPANY (Transmission Division), KALAMAZOO 13F, MICHIGAN

Unit Drop Forge Division, Milwaukee 1, Wis. • WESTERN DISTRICT OFFICE (SALES & SERVICE—BOTH DIVISIONS), 1060 E. 11th Street, Oakland 6, Calif.

Montana Uses Radio For Highway Repair

(Continued from preceding page)

mounted in a horizontal position 10 inches above the base of the tank. They extend approximately 10 feet into the tank, and are operated by magnetic contactor switches and adjustable thermostats.

The pumping unit is a Model ZQ Viking 3-inch pump, with a 7½-hp 220-volt 1,200-rpm standard open motor. The motor has a manual starter and automatic overload protection. It, with the pump, can handle 100 gpm of asphalt.

The most economical temperature at which to maintain the road oil is approximately 190 degrees. An analysis of operating costs, following the installation, showed the monthly expense to be as follows:

Month	Operating Costs
July, 1948	$ 85.85
August	109.10
September	141.24
October	128.05
November	89.43
December	0.75
January, 1949	0.75
February	0.75
March	104.84
April	59.18
May	126.52
June	109.48

Previous to this installation, the cost for maintaining asphalt by the steam method averaged $84 per 24-hour day, or $2,520 per month if oil was necessary a whole month. The scheme has resulted in great labor saving, and an increase in the number of hours per day of effective working time of patching equipment.

Snow Removal Tough

Montana's maintenance crews have as tough a snow battle as any in the country. Up on Lookout Pass on U. S. 10 they have 560 inches of snow per year, and the average snow depth over the state is from 50 to 60 inches. Wind velocities go as high as 105 mph in the vicinity of Cut Bank, and men have worked at snow removal around Chester and Wolf Point in temperatures of 57 degrees below zero. For that reason, snow-removal equipment is manned without exception by seasoned maintenance men picked for experience, judgment, and physical stamina.

At a recent count, Montana had 201 light push plows, 71 heavy V's with wings, and 12 rotaries. Methods of using this equipment duplicate the experience of other Rocky Mountain and Great Plains states. Light trucks and blade plows are the first line of defense, and they start work shortly after the snow begins to fall. They move at high speed, and will take 6 to 8 inches entirely off the roadway.

Heavier falls call for the V-plows. The rotaries come in when severe drifting winds fill up cut sections, and they also are useful for widening a roadway after lighter equipment has windrowed snow in close to the pavement. Rotaries are used constantly in the heavy-snow areas in the mountains.

This winter the main plow units will all have 2-way Motorola radio sets, and Carmichael expects to keep the roads open with less effort than before.

The highly mechanized maintenance and snow-removal work is something which had its start many years back, but which has now been crystallized into a good, sound program. "Credit for the present program", says Carmichael, "goes to the old heads in the Maintenance Department, from top to bottom, all over the state." Martin reports that his most serious staff complaint came from one of his sectionmen, a foreman on approximately 30 miles of highway, who said, "My God! You gotta get up yesterday."

Burggraf Heads HRB

The Highway Research Board, Washington, D. C., announces the appointment of Fred Burggraf as Director of the Board, to succeed the late Roy W. Crum. Mr. Burggraf, an expert of many years' standing on all aspects of highway engineering, has been associated with the Highway Research Board for 15 years. In 1945 he was named Associate Director, and he has been Acting Director since Mr. Crum's death last spring.

Twice associated with the Bureau of Standards, Mr. Burggraf conducted research investigations for it on the expansive behavior of unsound cements subjected to various treatments and at different ages and curing environments. For a period of 8 years he was Research Engineer for the Illinois Division of Highways. For another 8 years he was Research Engineer for the Calcium Chloride Association, of which he is a Research Fellow. His work for the Association included general supervision of fellowships on low-cost road stabilization, treatment of icy pavements, concrete curing, and dust alleviation, and basic research on cement constituents. Other activities during this interval were the development of a portable shear machine for field-testing the individual component layers of a flexible-type pavement, and a field method for controlling the amount of calcium chloride to use integrally in concrete to allow ample time for surface finishing operations.

Mr. Burggraf is active on a number of important committees and has contributed numerous papers on highway research problems.

THE ANSWER TO THE ENGINEER'S PRAYER

BREAKS CONCRETE FASTER

TAMPS BACKFILL BETTER AND FASTER FOR LESS

THE NEW, MORE POWERFUL

MIGHTY "B" MIDGET

Fastest Pneumatic Concrete Breaker and Backfill Tamper. Replaces all the dirt removed after pipe has been laid.
Gives you high density compaction. Ready to repave immediately. No temporary paving. No spoil dirt to haul away. Due to high density compaction, requires little asphalt in replacement. Cuts cost of tamping and breaking of concrete many times. Can be worked manually or automatically. 160' Compressor for full capacity or 105' Compressor for ½ capacity.
For further particulars, see your nearest dealer, or write Department C.

R. P. B. CORPORATION

2751 East 11th Street Los Angeles 23, California

LORAIN MC-504W PACESETTER ON STEEL ERECTION

■ Here's steel erection at its best! Smooth . . . accurate . . . fast . . . maneuverable! And you get them all with a Lorain 25-ton Moto-Crane, Model MC-504W. *Smooth* — because of throttle control of load made possible by the hydraulic coupling power take-off. No jerks, no jolts, no slam-bang. *Accurate* — pin-point precision with infinite range of raising and lowering speeds. *Fast* — big, 220 H.P. carrier engine moves special Thew-designed, Thew-built carrier quickly to cover lots of territory, through 10 travel speeds up to 30 M.P.H. *Maneuverable* — with the power, tractive effort and rubber-tire "flotation" for covering the job from start to finish — unloading, distributing, erecting. Fully convertible from crane to dragline, clamshell, shovel, hoe.

THE THEW SHOVEL CO., LORAIN, OHIO

Three 25-ton Lorain Moto-Cranes, Model MC-504W, using 100 ft. booms, (maximum 130 ft.) work in unison to set precisely giant arches on the 1½ million dollar City of Providence, R. I. transit pier shed. Gilbane Building Corp. of Providence are the contractors — *and owners of 12 Lorains.*

THEW LORAIN®

The self-priming Motorpump is designed to work under suction lift where the presence of air or vapor makes it impractical to use a centrifugal pump.

Self-Priming Pump

A new line of self-priming Motorpumps has been introduced by Ingersoll-Rand, 11 Broadway, New York 4, N. Y. They are designed to pump under suction lift where the presence of air or vapor makes it impractical to use centrifugal pumps.

The self-priming Motorpump recirculates liquid trapped in the casing. The pump impeller discharges through two passages into a discharge chamber. During priming the upper passage discharges a mixture of vapor and liquid into the discharge chamber. Here the vapor separates from the liquid and passes out the discharge pipe. The remaining liquid re-enters the impeller through the lower passage to mix with more vapor drawn in from the suction pipe, and is separated from the liquid in the same manner. When the suction pipe is finally filled with liquid and the pump is primed, flow through the lower passage reverses and both passages act as normal pump discharges. During normal pump operation there are no recirculation losses and thus no need of valves to cut off recirculation, the company says. No flap valve is used because the pump casing is so proportioned that sufficient liquid is trapped on shutdown to insure priming when the unit is restarted.

The pump is built in sizes from ¼ to 25 hp with capacities up to 800 gpm and a head up to 180 feet. Standard models use cast-iron casings with bronze impellers and are driven by NEMA motors. These pumps are also available mounted on ball-bearing-equipped cradles to be driven through a coupling by a motor, engine, or turbine. The pumps range in over-all size from 7 3/32 x 14⅛ x 8¾ inches to 35¼ x 25⅞ x 17½ inches. The weight range is from 110 to 625 pounds with motor.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 115.

Broadside on Fastening

It's as easy to load, ram, and set fasteners as it is to light a pipe, according to a broadside issued by Ramset Fasteners, Inc., 12117 Berea Road, Cleveland 11, Ohio. The company's fastening system may be applied to steel, concrete, wood, brick, or any combination of these materials.

The literature outlines the wide range of fasteners, available in 76 styles and sizes. It also covers the features of this system, including the 3-way safety control, all-steel tool construction, carrying kit, and 4-way choice of power charges for each tool. It presents case histories of time and cost savings, determined by an independent engineering firm.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 215.

Highway Land Acquisition

The annual report of the Committee on Land Acquisition and Control of Highway Access and Adjacent Areas appears in Highway Research Board Bulletin No. 38. The report, presented by David R. Levin, Committee Chairman, is organized on a state-by-state basis and quotes recent laws, ordinances, and court decisions affecting roadside control, parking, land acquisition, and related questions.

Also included in the bulletin are five papers dealing with urban redevelopment and highway planning; restricted dedication of right-of-ways for new expressways; legal and administrative control of the roadside in Oregon; the progress of the Minnesota roadside survey; and the plan for New Hampshire roadside improvement by voluntary cooperation.

Bulletin No. 38 may be obtained from the Highway Research Board of the National Research Council, 2101 Constitution Ave., Washington 25, D. C. The price is $1.20.

New Pipe Coupling

A compression pipe coupling for reducing electrolytic corrosion and turbulence at pipe joints is being manufactured by the Morris Coupling & Clamp Co., P. O. Box 632, Ellwood City, Pa. It is made up of three parts: a gasket, steel inner sleeve, and steel outer shell. All parts are available in a variety of materials for specific jobs.

The coupling comes in ½ to 14-inch standard pipe sizes including intermediate tube sizes. It will couple ferrous to ferrous or ferrous to nonferrous materials. It couples threaded to nonthreaded pipe as safely and easily as threaded to threaded, the company says.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 125.

The Morris compression pipe coupling is designed to reduce electrolytic corrosion and turbulence at pipe joints.

How to get

MORE WORK

from your "Cat" Motor Grader!

HERE's the situation in a nutshell. The speed, versatility and big work capacity that have made "Caterpillar" Motor Graders an essential construction tool have also made them necessary to the defense effort. As military orders must be filled first, you may not be able to obtain prompt delivery of new machines. So it will pay you to plan *now* to get greater production and longer wear from your present equipment.

"Cat" Motor Graders are ruggedly built for long life. But good care on your part can lengthen that life span by thousands of extra service hours. Here's how:

1 Follow the recommended *operating* care in your Operator's Instruction Book. Read and reread it.

2 Observe the *maintenance* suggestions in the Operator's Instruction Book. They're down-to-earth — experience has proved them practical and effective.

3 Anticipate your future replacement parts needs by seeing your "Caterpillar" dealer about them *now*. Don't wait until wear gets beyond repair — many a part can be rebuilt *if* serviced in time.

You're in good hands when you work closely with your "Caterpillar" dealer. He is anxious to help you solve your problems. He has the skilled mechanics and service facilities to help you lick them and keep your equipment in shape.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

You're the Doctor Preventive maintenance is good medicine for long life. Your Operator's Instruction Book is invaluable in the fight to conserve machine life. Follow the operation, lubrication and maintenance recommendations. When wear is evidenced in cutting edges, gears, tires or engine, see your "Caterpillar" dealer. He can help you prolong the life of your motor grader. Your motor grader is essential—don't abuse it!

Fast worker—reliable, too! This "Caterpillar" Diesel No. 12 Motor Grader is one of thousands that help construction men meet their contracts on schedule. An essential earthmoving tool, it stands up under tough going — handles easily. As a military tool, it's essential for airport construction and maintenance, road construction, the establishment of bases and scores of other jobs.

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES • TRACTORS • MOTOR GRADERS

EARTHMOVING EQUIPMENT

Funds to Engineers For '52 Civil Works

In fiscal '52 the U. S. Army Corps of Engineers will have $581,217,713 at its disposal for civil works. The funds were included in the Department of the Army Civil Functions Appropriation Bill signed by the President on October 24. They will finance the flood-control and river and harbor program authorized by Congress and assigned by it to the Corps of Engineers.

All projects were carefully screened to include those which offer the greatest contribution to national defense and the strengthening of civilian economy. In the final choice, emphasis was laid, as in the previous year, on dams and reservoirs that will produce urgently needed hydroelectric power.

Construction funds for projects total $478,376,713, with a breakdown as follows: general flood control—$306,184,100 for 78 projects in 32 states; rivers and harbors—$125,192,613 for 43 projects in 29 states and Alaska; Mississippi River and tributaries flood control—$46,000,000; Sacramento River flood control in California—$1,000,000.

Continuation of projects already under way accounts for practically all the construction funds. Some were provided, however, to initiate construction on three multiple-purpose reservoir projects with facilities to produce hydroelectric power—the Dalles Lock and Dam, Oreg. and Wash.; Old Hickory Lock and Dam, Tenn.; and Gavins Point Reservoir, S. Dak. and Nebr. (The funds for Gavins Point Reservoir will be derived by transfer from funds appropriated for Fort Randall Reservoir, S. Dak.) Funds were also provided for the initiation of construction on the following individual projects—Pine Bluff, Ark.; Pueblo, Colo.; Vincennes, Ind.; Hutchinson, Kans.; Aitkin, Minn.; Quinby Creek, Va.; and Clinton, Iowa.

New funds appropriated for planning total $1,500,000—$1,000,000 for general flood control and $500,000 for rivers and harbors. These funds will be coupled with unobligated balances. With the exception of three projects specifically earmarked by Congress for planning funds, no planning may be undertaken or continued unless certified by the President as necessary to the defense effort. The three projects specifically given planning funds are all in Kansas: Tuttle Creek Reservoir, $400,000; Strawn Reservoir, $250,000; and Toronto Reservoir, $100,000.

The only new funds allocated to surveys go to two comprehensive investigations already under way, the New England-New York survey, $400,000; and the Arkansas-White-Red River Basin survey, $400,000.

Geophysical Lab Expands

Midwestern Geophysical Laboratory, Tulsa, Okla., manufacturer of precision instruments, has moved into new buildings and acquired two research men from the Massachusetts Institute of Technology to fill posts on its staff.

The two new buildings are at 3400 S. Harvard in Tulsa. The main one, of approximately 15,000-square-foot floor space, houses offices, drafting and electrical assembly, galvanometer shop, and experimental laboratory, and its second floor is divided into a cafeteria-kitchen-lounge for the employees and a directors' conference room. The second building—covering about 7,000 square feet of floor space—is a precision-equipped machine shop, part of which is given over to shipping of finished instruments and receiving and storing of materials and components. Midwestern hopes soon to start work on two more buildings to complete an integrated plant able to handle all processes from metal forming and fabrication to final paint or plating finish.

The two new members of the staff from M. I. T. are Raymond D. Atchley, Vice President in Charge of Engineering, and Donald G. O'Brien, Chief Engineer.

CARCO WINCHES DO "BULL-COOKING" JOBS

Anchoring a "dead man" calls for a cable under tension, with plenty of control—another job for the Carco winch!

Put a Carco winch on a crawler or wheeled tractor—any make—and you have a general-purpose tool that will save time and money on every construction project. It can pull stumps, clear land, wreck or move existing structures, tow heavy machinery and rescue stuck equipment, reaching out hundreds of feet if necessary to get hold of the load. The Carco winch doubles the tractor's pulling power, yet seldom requires attention and permits full, efficient use of the tractor for other purposes.

1st in Volume—1st in Value!

CARCO
Winches for all makes of tractors

Because Carco builds more tractor winches than any other manufacturer, and for more makes of tractors, you're always close to a Carco dealer with parts, service, full data on any model.

PACIFIC CAR AND FOUNDRY COMPANY
RENTON, WASHINGTON Branches: PORTLAND, ORE. and FRANKLIN PARK, ILL.

BEAVER 26-R

the only tool of its kind that . . .

. . . cuts either standard "taper" or electric "straight" conduit threads by a simple adjustment.

. . . has "radio" dial size-setting. Dies can be removed in a few seconds FROM THE OUTSIDE without use of tools.

. . . is fully-adjustable and easy-working. The only 1 to 2-inch pipe threader that cuts standard, oversize and undersize threads of uniform standard length.

The Beaver 26-R uses one set of dies to thread four sizes—1, 1¼, 1½ and 2-inch. It is fully-adjustable for oversize or undersize threads to compensate for variation in fittings. There's a cam-type universal self-centering chuck, too, which centers the pipe accurately and insures straight pipe lines. Yet, "drip threads" may be cut when desired for heating lines.

Your customers benefit from the advantages of Beaver 26-R. Why not tell them about it today?

SEND FOR BEAVER CATALOG NO. 51
Address Beaver Pipe Tools, Inc., 258-300 Dana Avenue, Warren, Ohio, U. S. A.

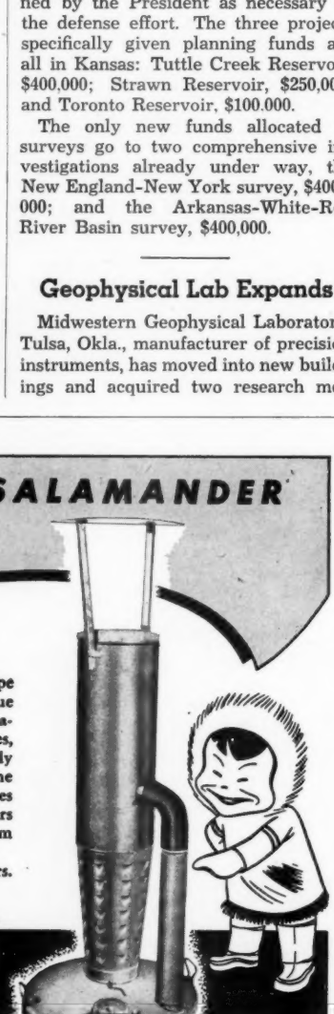
BEAVER PIPE TOOLS
258-300 DANA AVE. · WARREN, OHIO, U. S. A.

HERE'S AN OIL BURNING SALAMANDER that's really SMOKELESS!

. . . even at a high burning rate

When you buy a salamander you want heat . . . not smoke! Ordinary bowl-type salamanders may be smokeless at low and medium burning rates, and may continue to be smokeless at these burning rates if cleaned often enough. The HY-LO Salamander is not only the cleanest burning heater at *both* low and high burning rates, but *continues* this same smokeless burning with far less attention. This definitely superior performance of the HY-LO Salamander is accomplished by the use of the patented return gas stack principle. This return gas stack returns consumed gases to the bowl, resulting in better combustion and elimination of carbon. Salamanders are purchased for use during low and extremely low temperatures and maximum heat out-put is, therefore, essential.
Insist on clean-burning HY-LOs . . . they cost no more than ordinary salamanders.

Distributors in all principal cities.
Wire collect for name of your nearest distributor.



Height—62¾"
Diameter of bowl—19"
PATENT NO. 2284157

OUTSTANDING HY-LO FEATURES FOR SAFETY AND EFFICIENCY
Patented Return Gas Stack
Extinguishing Damper
Handy Carrying Clamp-Handles

HY-LO OIL BURNING SALAMANDER

SCHEU PRODUCTS COMPANY
272 STOWELL STREET
UPLAND, CALIFORNIA

Crusher Eliminates Jaw-Plate Rubbing

A crusher which is said to eliminate rubbing and wear of the jaw plates is made by Straub Mfg. Co., 532 Chestnut St., Oakland, Calif. The Kue-Ken is available in sizes from 12 x 7 to 60 x 48 inches and permits 350 to 425 crushing strokes per minute, the company says.

The jaw of the Kue-Ken passes squarely through the center line of the crushing zone, instantly gripping and crushing, without forcing the rock upward. This eliminates rubbing. Maximum leverage is applied to the largest rocks, where it is needed, the company says.

The mechanism is completely sealed against dirt and dust. The flywheel releases instantly for tramp iron or overload. It can be quickly reset and has no shearing or breaking parts, Straub reports. The crusher has positive gear-pump lubrication.

Further information on Kue-Ken crusher may be secured from the company. Or use the Request Card at page 16. Circle No. 195.

Aerial Surveys and Maps

An 18-page booklet prepared by Abrams Aerial Survey Corp., 606 E. Shiawassee St., Lansing 1, Mich., provides a simple explanation and many illustrations of aerial photogrammetric work. It shows products—mosaics, atlas sheets, and maps—that are made from aerial photographs and explains ways in which aerial mapping can save time and money on engineering projects. The booklet diagrams the photogrammetric process and illustrates the planes, cameras, and instruments used in the work.

The company points out that aerial surveying is comparable in accuracy with the best ground methods. Not only can aerial surveys be used in almost every situation where ground surveys are used, but in many instances the terrain is so rugged that the only practical way to map an area is from the air, the company says. The booklet includes sample planimetric, topographic, and plan and profile maps.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 144.

"Who's the salami with mustard?"

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PENNSYLVANIA—Atlas Equipment Corp., 635 Ridge Ave., Pittsburgh 12.
Standard Equipment Co., 152 Horton St., Wilkes-Barre; Hepburn & Lycoming Sts., Williamsport.
L. B. Smith, Inc., Camp Hill (Harrisburg); 29th & Montgomery Avenue, Philadelphia.

RHODE ISLAND—Clark-Wilcox Co., Boston 34, Mass.

SOUTH CAROLINA—Southern Equipment Sales Co., Sumter Highway, Columbia.

SOUTH DAKOTA—The Euclid Road Machinery Co., Hibbing, Minnesota.

TENNESSEE—Euclid-Memphis Sales, Inc., 185 E. Butler Ave., Memphis 2.
Power Equipment Co., 1218 Island Home Ave., Knoxville; 600 W. Manning St., Chattanooga.

TEXAS—The Euclid Road Machinery Co., 2524-26 Main St., Dallas 1.
Lively Equipment Co., Albuquerque, New Mexico.

UTAH—Foulger Equipment Co., 1361 So. 2nd West, Salt Lake City 8.

VERMONT—Clark-Wilcox Co., Boston 34, Mass.

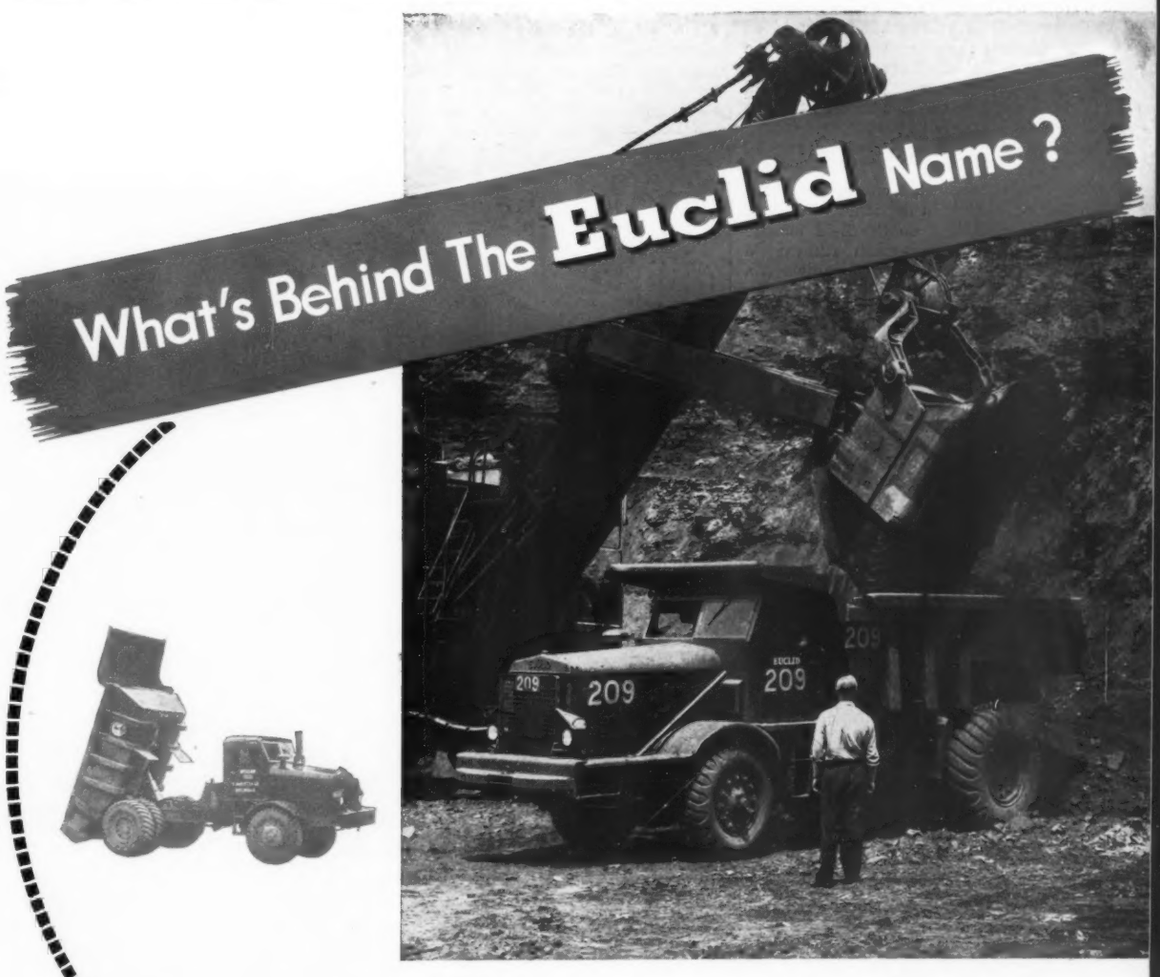
VIRGINIA—Hampton Roads Tractor & Equipment Co., W. 39th and Killam Ave., Norfolk.
Rish Equipment Co., 1501 Chamberlayne Ave., Richmond 10; 405 Center Ave. N.W., Roanoke 7.

WASHINGTON—A. H. Cox & Co., 1757 1st Ave. So., Seattle 4; 2015 Center St., Tacoma; 313 North Mission, Wenatchee.
P. L. Crooks & Co., Portland, Oregon.
Intermountain Equipment Co., E. 611 Sprague Ave., Spokane 5.

WEST VIRGINIA—Atlas Equipment Corp., Pittsburgh 12, Pennsylvania.
Rish Equipment Co., Kanawha Blvd., Charleston 22; East on U.S. 60, Clarksburg; P.O. Box 209, Bluefield.
L. B. Smith, Inc., Philadelphia, Penna.

WISCONSIN—Euclid-Chicago Co., Chicago 31, Ill.
The Euclid Road Machinery Co., Hibbing Minn.

WYOMING—Constructors Equipment Co., Denver 5, Colorado.
Foulger Equipment Co., Salt Lake City 8, Utah.



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Plenty of power . . . large capacity for bigger loads . . . body designs for all types of materials . . . earth, ore, rock, or coal. Rear-Dump Euclids range in capacity from 10 to 34 tons, have diesel engines from 125 to 400 h.p. Bottom-Dump Euclids have capacities of 13 to 50 cu. yds., 20 to 40 tons with diesel engines to 300 h.p.

Repeat orders prove customer satisfaction. Owners say that "Eucs" actually cost less to own than any other hauling equipment. Euclid dependability will pay off on your present or future jobs. Write for complete information on the Euclid line, or call your distributor today.

The EUCLID ROAD MACHINERY CO.,
CLEVELAND 17, OHIO

MORE LOADS PER HOUR— MORE PROFIT PER LOAD

EUCLIDS *Move the Earth*

Enlarged Air Base Takes Jet Trainers

Tyndall Field Improvements Include Two 8,000-Foot Runways Of Plain Concrete; Taxiway and Apron Also Constructed

By WILLIAM H. QUIRK,
Eastern Editor

• TYNDALL Air Force Base in northern Florida has been enlarged this year to accommodate jet training planes now using the big Air Force base. One of the four existing runways has been extended to 8,000 feet, and a new runway of the same length has been added along with the necessary taxiway and apron facilities. These improvements got under way on February 15, and were completed in September at a cost of approximately $3,000,000.

Tyndall Field is 10 miles east of Panama City adjoining U. S. 98, with St. Andrews Bay on one side and the Gulf of Mexico on the other. The four original runways on the field include a 5,200-foot north-south runway, a 5,100 northeast-southwest runway, a 6,127-foot east-west runway, and a 5,587-foot northwest-southeast runway. All are of plain-concrete construction 150 feet wide.

Recent construction was under the supervision of the U. S. Army, Corps of Engineers, Mobile District, which awarded an initial improvement contract to the Wright Contracting Co. of Columbus, Ga., on a low bid of $1,241,-034. This contract covered the extension of the 5,587-foot northwest-southeast runway to 8,000 feet, together with the building of a connecting taxiway and two aprons. Later, when it was decided to construct a new 8,000-foot runway, a contract for the additional work was negotiated with the same contractor.

Plain-Concrete Construction

On the runway extension, the pavement conforms to the existing section of plain-concrete runway, with a 10-7-7-10-inch slab. The thickened depth to 10 inches occurs in the outer 12½ feet along each edge of runway. For the final 300 feet of runway where the planes pause before taking off, the slab is strengthened with a deeper 12-10-10-12-inch section. Again the depth is increased in the outside 12½ feet. The new runway is 200 feet wide, as compared to the 150-foot width of the existing strips. It has a cross section of 9-inch uniform pavement, with the exception that a 1,000-foot section on each end is a 10-inch uniform section.

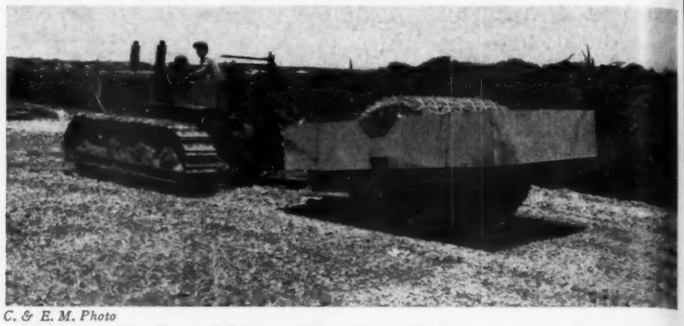
From the center line the concrete pavement slopes at the rate of 1.5 per cent to each edge. Shoulders are continued out for 200 feet on each side on a 2 per cent slope. There is little difference in elevation longitudinally along the runways. The new 8,000-foot runway is parallel to and 1,500 feet north of the northwest-southeast runway that was extended.

The two new connecting taxiways are 1,500 feet each, 75 feet wide, and are 10 inches thick increasing to 12 inches along the edges. The apron at the southeast end of the field is 800 x 682 feet, while the northwest apron is 750 x 290 feet. Both are 10-inch plain concrete.

Grading and Drainage

In preparation for the paving, 229 acres of land were cleared and grubbed, with the unclassified excavation totaling 305,000 cubic yards. The soil is mostly sand in this area, but a few pockets of muck were encountered which were undercut and replaced with sand or suitable material. No borrow was required, and about 30,000 yards of material was wasted, for the subgrade of the runways follows closely the existing ground with no high fill embankments being required along this coastal plain. The average finished grade of the field is at 15.0 elevation.

Storm water drains into inlets of which there are 93 on the project, located within the paved area at the aprons and at the outside edge of the shoulders along the runways. The inlets are connected by concrete pipe, 12 to 48 inches in diameter, which eventually empties into one large drainage structure. Under the runway extension this 8 x 4-foot double-barrel culvert is 645 feet long. Farther north, under the new runway, the structure enlarges to a triple-barrel 9 x 4-foot culvert, 1,000 feet long. The culvert empties into a big drainage ditch beyond the construction area, which flows north into East St. Andrews Bay.



C. & E. M. Photo

A Hyster grid roller pulled by an International TD-18 tractor compacts a taxiway fill at Tyndall Air Force Base.

On the grading the Wright Contracting Co. moved dirt with both rubber-tired and crawler equipment. The former included 3 Caterpillar DW10 tractors pulling No. 10 scrapers built up to 12-yard capacity. The tractor-scraper units were made up of a Cater-

(Continued on next page)

EFFICIENCY UP...

Photo Courtesy Schramm, Inc.

COSTS DOWN...

TUNE IN . . . TEXACO STAR THEATER starring MILTON BERLE on television every Tuesday night. METROPOLITAN OPERA broadcasts every Saturday afternoon.

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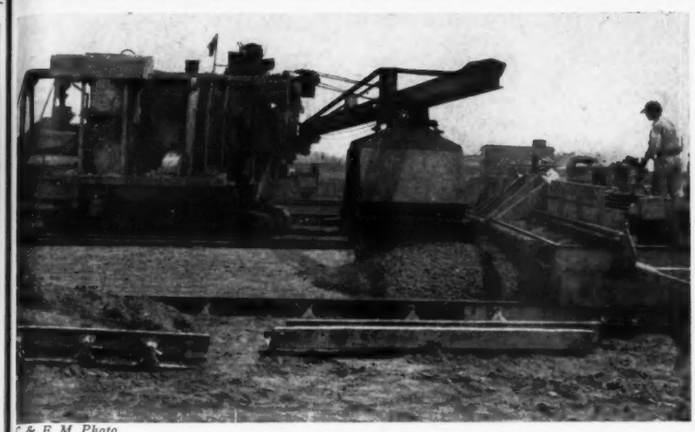

C. & E. M. Photo
A Koehring 34-E Twinbatch paver drops a bucket of runway concrete in front of a Blaw-Knox spreader on the Tyndall Field project.

C. & E. M. Photo
After laying one 25-foot lane, the equipment is moved two lanes over to begin paving in the opposite direction. Simplex jacks helped here.

pillar D8 with an 18-yard No. 80 scraper; an Allis-Chalmers HD-18 with a 12-yard No. 70 Caterpillar scraper; an International TD-24 with a Heil 22-yard scraper; and two International TD-18's with LeTourneau Carryalls—a J8 at 8 yards and an LP at 9 yards. Haul lengths went up to 1,200 feet with the crawler equipment, and averaged 1,800 feet with the rubber-tired machines.

Three draglines of ¾-yard size—Bucyrus-Erie, Insley, and Northwest—excavated muck with Hendrix buckets, and dug trenches and set drainage pipe. Fills were leveled by four dozers—two TD-14's, a TD-18, and a D7—and compacted by tamping rollers, a Hyster grid roller, and rubber-tire rollers, until the subgrade had a weight of 250 pounds to the cubic foot.

Paves 25-Foot Lanes

Paving was done in 25-foot lanes within Heltzel steel forms of which there were 4,000 linear feet on the job. Final shaping of the subgrade was done by a Caterpillar motor grader, and the exact cross section was cut by either a Cleveland Trailgrader or a Jaeger-Lakewood planer pulled by a TD-14 tractor. Contraction joints are spaced 15 feet apart, with an expansion joint every 350 feet.

The Virginia Steel Co. of Richmond, Va., supplied the assemblies for the expansion joints and all dowel bars. The expansion material is Johns-Manville, one inch thick, and cut to a depth of ¾ inch below the top of pavement. Dowels at the expansion joints are ¾ x 16-inch in 7-inch pavement, 1¼-inch in 10-inch pavement, and are spaced on 12-inch centers. The only other dowels are along the inside edge of the outside lane, tying it in to the rest of the runway, and in construction joints. These longitudinal pieces are ⅝ x 30-inch bars on 30-inch centers. The other lanes are tied together by 1-inch keyways made by bolting 1-inch wooden strips to the sides of the steel forms.

Concrete Batch Plant

The batch plant was set up at the southeast end of the field where it would not interfere with the operation of planes on the existing runways. Average haul to the paver was one mile, with a maximum haul of 2 miles. The nearest rail connection to the air field is a siding on The Bay Line, 8 miles to the west, where the contractor had a field office in two railroad cars. Two sizes of slag—2-inch down, and ¾-inch to No. 4—for the coarse aggregate were shipped to the siding in hopper-bottom cars from the Birmingham Slag Co. at Birmingham, Ala. A Burch conveyor under the cars unloaded the material into trucks that hauled it to the batch plant.

Local sand from Callaway Pit, only 12 miles from the field, was used as fine aggregate, and delivered by truck to the plant. The material was stockpiled alongside separate storage bins. A Blaw-Knox 150-ton bin was charged with slag by a Koehring 301 crane equipped with a 45-foot boom and a ¾-yard clamshell bucket. A Northwest ¾-yard machine loaded sand into a Heltzel 100-ton bin.

Cement for the mix was used in the

(Concluded on next page)

. . . when you use Texaco air compressor oil

EFFICIENT, economical air compressor operation requires an oil that is *exactly right* for your particular operating conditions. To meet this requirement you have only to use the recommended Texaco air compressor oil. A Texaco Lubrication Engineer will gladly help you.

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Call in a Texaco Lubrication Engineer. Let him tell you about the Texaco Simplified Lubrication Plan that will let you handle *all* your major lubrication with *only six* Texaco lubricants. A time-saving, cost-saving setup. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N.Y.

LONGER DRILL LIFE, more footage drilled, lower costs — count on these benefits when you use *Texaco Rock Drill Lubricant EP*. This series of "extreme pressure" lubricants give full protection against wear, guard against rust whether drills are running or idle.

Lubricants and Fuels
FOR ALL CONTRACTORS' EQUIPMENT

Enlarged Air Base Takes Jet Trainers

(Continued from preceding page)

approximate proportions of 75 per cent portland, air-entrained at the mill, and 25 per cent slag cement. The portland came from Lehigh, Alpha, and Lone Star plants in the Birmingham, Ala., vicinity, while the Magnolia brand from Birmingham was used for the slag cement. Cement was delivered in bulk to the siding where it was unloaded by a Blaw-Knox worm gear under the track and raised on an enclosed elevator to load two covered trucks that hauled the cement to the plant. Cement was stored in a Heltzel 1,000-barrel bin, partitioned to divide the portland and the slag.

Up to 12 trucks, holding either 2 or 3 batches, hauled the materials to the paver. They backed under the slag and sand bins, and drove through the cement bin. A batch contained 37½ cubic feet of concrete. The weights of a typical batch, with 6 per cent moisture in the sand, were as follows:

Portland cement	587 lbs.
Slag cement	165 lbs.
Water (43.8 gals.)	382 lbs.
Sand	1,621 lbs.
Small slag	1,072 lbs.
Coarse slag	1,312 lbs.
Total	5,139 lbs.

Paves Runway Extension First

Paving operations got under way April 18 on the extension to the existing runway. This was completed, also the taxiway and aprons, before any concrete was laid on the new runway. Water for the mix was piped from facilities at the field out to where the work was in progress. Two tank trucks, holding 2,000 gallons each, hauled water from the supply line to the paver, and also provided water for wetting down the subgrade. A C. H. & E. 2-inch pump on the tank trailer transferred the water to the tank on the paver.

Batches were mixed 1½ minutes in a Koehring 34-E Twinbatch paver equipped with a 35-foot boom. It worked outside the forms laying alternate lanes. Concrete was placed between oiled forms in front of a Blaw-Knox spreader which was followed by a Jaeger-Lakewood dual-screed finisher. The finisher carried a White vibrator on the front end to vibrate the concrete along the forms. Following that was a Heltzel Flex-Plane machine that cut the longitudinal and transverse contraction joints to permit the insertion of steel strips 2 inches deep x ¼ inch in width.

Behind the joint-insertion machine was a Koehring Longitudinal Finisher. After it had done its work, the surface of the concrete was checked with long-handle aluminum straightedges, one on each side. The top of the slab was finished off by an 8-inch rubber belt mounted on a screed frame pulled by hand across the forms. Joints were then edged to ¼-inch radius from a finishers' 4-wheel bridge, while the steel strips were pulled from another bridge. After the final edging, Hunt Process Clear curing compound was applied from a Heltzel Flex-Plane bridge at the rate of one gallon for 200 square feet.

All joints were sealed with asphalt by the Joint Maintenance Co. of Lynbrook, N. Y., under a subcontract.

Does 1,000 Feet a Day

After alternate lanes were laid across the width of the runway, the paver moved back and worked from the subgrade to fill in the other lanes. Batch trucks then backed in to the paver, and returned to the plant on pavement lanes of sufficient age to withstand traffic. Ramps were put in to facilitate their movement. When the new runway got under way, a Koehring 27-E paver was added to speed production, with both machines depositing batches of concrete in the same 25-foot lane. An average of 1,000 linear feet of 25-foot pavement was laid in a 10-hour day. Little time was consumed in shifting the finishing equipment from one lane to another. Simplex 15-ton jacks, having a lift of 13 inches, were used in transferring the heavy machines from one set of form rails to another.

Major construction items in the extension and new-runway contracts included the following:

Unclassified excavation	305,000 cu. yds.
Concrete pavement	418,000 sq. yds.
Concrete pipe, 12 to 48-inch	38,000 lin. ft.

Wright Contracting Co. employed an average force of 156 on the project under the supervision of Claude Matthews, Vice President and General Superintendent. John D. Stewart was Superintendent on the grading, Bill Blount at the batch plant, and Percy Gregory on the paving; Robert W. Carlton was field engineer for the contractor.

For the U. S. Army, Corps of Engineers, James A. Bennett, Jr., was Resident Engineer. The Mobile District directing the work is headed by Col. W. K. Wilson, Jr., District Engineer.

During the construction of the extension, Colonel James E. Roberts was the Commanding Officer of Tyndall Air Force Base. All work on the project was coordinated with the Air Installations Officer, Major Henry J. Stehling.

Burda Has New Onan Post

D. W Onan & Sons, Inc., Minneapolis, Minn., manufacturer of electric generating plants, has appointed George R. Burda as Sales Promotion Manager. Mr. Burda has been with the company since 1942.

Edwin C. Swenson of the Service Department succeeds Mr. Burda as Regional Manager of the Eastern Zone.

Surfa-slick Patent Applied For

SELF-HEATING ASPHALT SMOOTHING IRON

HOT IN TEN MINUTES

HOT ALL DAY LONG

Contractors! This lightweight, rugged, simple, time and money saving smoothing iron will pay for itself in a few days' use.

No more building and tending fires on your asphalt jobs!

- RUGGED
- SIMPLE
- SAFE
- ECONOMICAL
- LABOR SAVING
- COMPACT

Dealer inquiries requested.

J. E. WOODS MFG. CO.
1516 First Street
San Fernando, California

Barber-Greene

840 BITUMINOUS PAVING PLANT

B-G 840 Paving Plant, showing use of bulkhead feed with two-gate feeder for proportioning sand and gravel. 2, 3 or 4 aggregates may be blended in this manner.

PRACTICAL... PROFITABLE

UP TO 40 T. P. H.

The capacity range of this B-G Paving Plant has proved to be the most practical for a broad range of users. Output is high enough to supply materials for average-sized new construction and resurfacing jobs—investment is low enough to assure profitable operation at minimum capacities, or for intermittent operation.

ALL TYPES OF MIXES

Bituminous mixes of all types are produced at lowest cost with this B-G Plant. This includes the full range—all temperatures, all gradations and all binders. For "high-type" mixes, the aggregates are blended at the feeding end. Quality and uniformity are consistently high.

TRULY PORTABLE

Each basic unit of this plant—Mixer and Dryer-Dust Collector—is mounted complete on its own trailer-type pneumatic-tired chassis. Built-in hot and cold elevators and dryer stack fold down for transport. There is a minimum of dismantling—the plant can be moved and readied for work in new locations in a few hours' time.

EASIEST TO ERECT

No special erection equipment is needed to set up a B-G Paving Plant. No excavation or footings required. Units are spotted in place by truck, adjustable jacklegs are lowered to ground level, and the plant is ready for operation once the required auxiliary equipment is in place.

LOW-COST MAINTENANCE

The B-G Model 840 Paving Plant is easy to maintain. All moving parts are quickly accessible for inspection and adjustment. B-G Distributors offer fast emergency parts service, and are staffed with factory-trained experts to help you keep your B-G Paving Plant at top operating efficiency.

AUTOMATIC PROPORTIONING

Simple to understand and to operate, the B-G Paving Plant eliminates the human element in producing a consistently uniform mix. Once the bitumen and aggregate proportions have been set, they cannot vary as the positive displacement pump and aggregate apron feeder are positively interlocked. Proportioning is continuous, automatic and accurate.

2118-4

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AURORA, ILL., U. S. A.

See your B-G Distributor

Floods Can Sabotage Our Defense Program

The world's largest fluorspar mines at Rosiclaire, Ill., yield a mineral essential as a fluxing agent in steel making. It is firmly believed in the district that Nazi saboteurs, who were landed by submarine and captured in this country during World War II, carried complete plans of these installations. However that may be, there is no doubt at all about the importance of these mines to our defense program. And they are vulnerable to a saboteur as ruthless as any human enemy and more impersonal—the Ohio River. Five times in the last 40 years the water has overflowed its banks, swept into the river town of 2,039 inhabitants, and poured down the mineshafts.

Something was at last done about this danger when the J. D. Barter Construction Co., Harrisburg, Ill., undertook, in July 1950, to build a floodwall to prevent any recurrence of these damaging floods. The $360,000 job, which was finished by September of this year, necessitated the moving of 300,000 cubic yards of dirt to form a two-section wall—one section 2,000 feet long, the other 1,500 feet. The contractor completed the project on time with the help of the following equipment: an International TD-24 crawler with scraper; two TD-18 crawlers for push-loading and tamping; TD-9 crawler with bucket loader for general utility work; a fleet of four 17½-yard motor scrapers; one Manitowoc crane with a 1½-yard bucket; and a No. 20 Thew-Lorain shovel with a ½-yard bucket.

An International TD-24 spreads fill, while a TD-18 compacts the final gap in a floodwall at Rosiclaire, Ill. This is the 2,000-foot-long section of the wall J. D. Barter Construction Co. built. The other section is 1,500 feet long.

Improved Steering With Power Boosters

A recent report from Garrison Mfg. Co., 1506 S. Santa Fe Ave., Los Angeles 21, Calif., indicates that its improved hydraulic power steering is now factory-approved by Allis-Chalmers for the company's heavy-duty motor graders. The Garrison hydraulic steering boosters are also applicable for heavy-duty wheel tractors, trucks, and other off-the-highway equipment. The company points out that this unit provides conventional mechanical steering with its "road feel", plus a hydraulic power booster. It is designed to make steering easy and eliminate road shock and wheel fight. The unit operates automatically as the operator steers.

Garrison reports that the steering booster is optional on Allis-Chalmers AD and BD motor graders and may be purchased through the dealer. The steering booster provides a steering-wheel-rim pull of approximately 8 to 10 pounds.

Further information and detailed data on applications may be obtained from Garrison. Or use the Request Card at page 16. Circle No. 170.

Catalog on Pipe Tools

A 16-page illustrative catalog on pipe tools has been prepared by The Ridge Tool Co., Elyria, Ohio. The line includes pipe wrenches, threaders, bolt dies, cutters, reamers, vises, extractors, sizing tools, portable power drives, and pipe and bolt-threading machines. An illustration, description, and specifications are given for each product.

The new Ridgid Model 400 portable power drive, designed for turning pipe for hand tools, is highlighted in the booklet. Used with the Ridgid universal driveshaft, it turns pipe for geared die stocks and cutters to 12-inch capacity. The company points out that the heavy-duty pipe wrenches are made in both end and straight patterns in sizes from 6 to 60 inches.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 165.

General Industrial Jacks

A bulletin describing a complete line of industrial jacks, applicable in many phases of the construction industry, is available from The Joyce-Cridland Co., 2027 E. First St., Dayton 3, Ohio. There are more than 200 types, sizes, and capacities, ranging from 1½ to 100 tons. The bulletin describes many of the models and provides data on lifting capacity, height, rise, and weight, along with illustrations.

The ratchet-lever models have an exclusive spring-pawl adjustment feature. The company points out that it is not necessary to disassemble the jack to service it. A reversing lever is conveniently located at the top of the jack. Screw jacks are built for handpower or power multiplied by gear and ratchet combinations. The heavy-duty air-motor-driven geared screw-type jacks are available in capacities to 100 tons.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 141.

DURAPLASTIC Aids Proper Concrete Placement in World's Biggest Bus Terminal

● To get a more uniform, more workable mix for New York City's new $24,000,000 bus terminal, Turner Construction Company used Duraplastic* air-entraining portland cement—31,000 barrels in all. Duraplastic requires less mixing water for a given slump. It gives a more plastic mix. Such mixes aid proper placement... result in an improved surface appearance.

The greater plasticity of Duraplastic concrete is due to billions of tiny air bubbles entrained in the mix. They minimize water gain and segregation. As a result, finished concrete made with Duraplastic is also fortified against the effects of freezing-thawing weather.

General Contractor: Turner Construction Co., New York, N. Y. Ready-mixed concrete supplied by Metropolitan Sand & Gravel Co. New York, N. Y.

YET DURAPLASTIC* COSTS NO MORE

It sells at the same price as regular cement. Complies with ASTM and Federal Specifications. For free booklet telling how Duraplastic can help you on your next job write: Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.

*"Duraplastic" is the registered trade mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company

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DE-D-125

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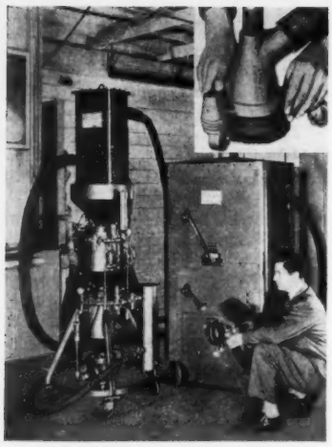
AIR-ENTRAINING PORTLAND CEMENT

A UNIVERSAL ATLAS PRODUCT

Makes Better Concrete at No Extra Cost

"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—NBC Network*



The Vacu-Blaster cleaner has a vacuum pickup that reclaims abrasive for re-use. It also removes dust and dirt.

Blast-Cleaning Unit With Vacuum Pickup

A unique blast cleaner, designed with a vacuum pickup to reclaim abrasive for re-use and provide independent collection of dirt and debris, is manufactured by Vacu-Blast Co., Inc., 350 Peninsular Ave., San Mateo, Calif. The Vacu-Blaster consists of three basic units: a vacuum-pump dust collector, a pressure-type generator-reclaimer, and a Vacu-Blast gun. It will operate from any standard source of compressed air, the pressure required depending upon the type of work being done.

The company points out that the exclusive vacuum pickup instantly removes spent abrasive, dust, and dirt. This means that the operator need not wear a protective mask or clothing, even in close-quarter work. The entire unit is mounted on dolly wheels and may be easily transported from one part of the job to another. The company cites the application of the Vacu-Blaster for work on concrete, brick, stone, metal, or wood surfaces.

The economy of the unit is apparent, since it reclaims and re-uses abrasive material while in operation. The Vacu-Blast gun is, in effect, a miniature blast cabinet. Abrasive is directed under high pressure through the blast nozzle and inner cone to the work. As soon as the abrasive has done its work, the vacuum pickup returns it through the outer cone (together with dirt, scale, rust, paint, or other debris) to a reclaimer, where the abrasive is separated from the debris and returned to the work. The entire system is completely enclosed against dust and dirt. This, the company points out, makes it especially adaptable for work in plant maintenance where normal production is to be continued.

Further information may be secured from the company by requesting the new 20-page detailed catalog. Or use the Request Card at page 16. Circle No. 167.

Chart on Welding Alloys

A new chart on Eutectic Low-Temperature welding alloys has been issued by Eutectic Welding Alloy Corp. Measuring 10 x 14 inches, it is suitable for wall hanging or for departmental files. It contains detailed specifications on nearly 200 metal-joining alloys and includes bonding temperatures, tensile strengths, and recommended uses.

Proper welding alloys are listed for all the major metals and their alloys, as well as for hard overlaying, cutting, chamfering, piercing, gouging, and joint preparation of all metals. There is a further subdivision of information which covers the use of the alloys with various heating methods.

Copies of this chart may be obtained free by writing to Eutectic Welding Alloys Corp., Department P, 172nd St. and Northern Blvd., Flushing, N. Y. Or use the Request Card at page 16. Circle No. 214.

Data on "Baby" Bulldozer

Complete technical data on the Mighty Mouse bulldozer are available from Mead Specialties Co., 4114 N. Knox Ave., Chicago 41, Ill. The literature shows how this versatile machine may be used for grading, backfilling, clearing land, carrying, or dumping. The basic unit weighs 900 pounds and has a width at the treads of only 36 inches. Self-cleaning high-traction crawler treads enable it to travel over almost any type of terrain. Other features cited for the Mighty Mouse are a turning radius of 8 feet and a 5-cubic-foot scoop bucket that will lift a load of over 500 pounds. Complete specifications and on-the-job photos are included in the bulletin.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 217.

INCREASE TUNNEL-DRIVING SPEEDS 80% and REDUCE LABOR COSTS 92% with

DEMO-CANON AUTOMATIC GANG DRILL

- Drilling Speeds of 7" to 36" per minute.
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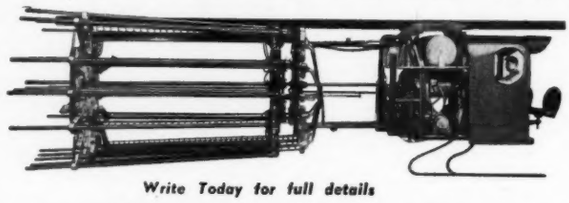

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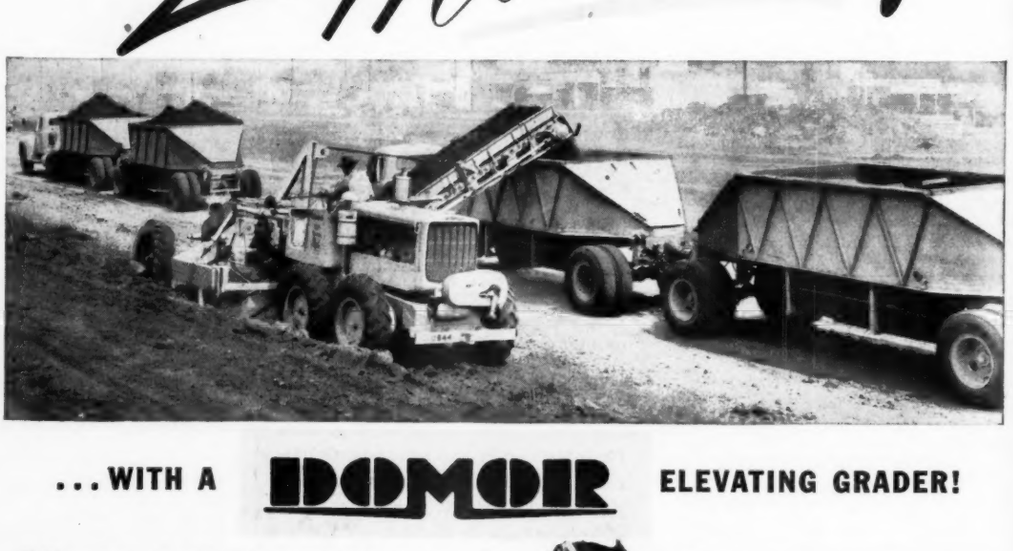

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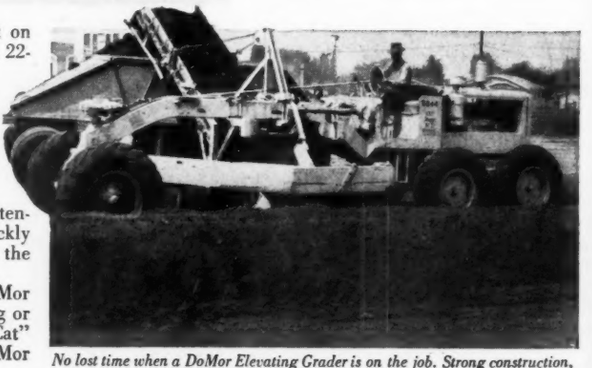

No lost time when a DoMor Elevating Grader is on the job. Strong construction, modern engineering keeps a full load moving steadily up the conveyor belt.

ULRICH PRODUCTS CORPORATION
ROANOKE, ILLINOIS

Convention Calendar

January 2-4—Weed Control Conference
Annual Meeting, Northeastern Weed Control Conference, New Yorker Hotel, New York, N. Y. Dr. Walter C. Jacob, Secretary-Treasurer, Long Island Vegetable Research Farm, Riverhead, Long Island, N. Y.

January 8-10—National Constructors Meeting
Annual Meeting, National Constructors Association, Waldorf-Astoria Hotel, New York, N. Y. J. F. Pritchard, President, 50 E. 41st St., New York 17, N. Y.

January 9-11—Photogrammetry Meeting
Annual Meeting, American Society of Photogrammetry, Shoreham Hotel, Washington, D. C. Max Salzman, Chairman, Meetings Committee, U. S. Navy Hydrographic Office, Washington 25, D. C.

January 15-18—HRB Meeting
Annual Meeting, Highway Research Board, National Academy of Science Bldg., Washington, D. C. Fred Burggraf, Director, 2101 Constitution Ave., Washington 25, D. C.

January 21-24—ARBA Meeting
Annual Meeting, American Road Builders' Association, Rice Hotel, Houston, Texas. Lt. Gen. Eugene Reybold, Executive Vice President, International Bldg., Washington 4, D. C.

January 27-31—AED Meeting
Annual Meeting, Associated Equipment Distributors, Stevens Hotel, Chicago, Ill. P. D. Hermann, Executive Secretary, 360 N. Michigan Ave., Chicago 1, Ill.

January 28-29—Landscape Architects Meeting
Annual Meeting, American Society of Landscape Architects, The Warwick Hotel, Philadelphia, Pa. Bradford Williams, Corresponding Secretary, 9 Park St., Boston 8, Mass.

February 10-14—National Sand & Gravel and National Ready Mixed Concrete Associations
Annual Conventions, National Sand & Gravel Association and National Ready Mixed Concrete Association, Stevens Hotel, Chicago, Ill. V. P. Ahearn, Executive Secretary, 1325 E St., N. W., Washington 4, D. C.

February 25-28—AGC Meeting
Annual Convention, Associated General Contractors of America, Statler Hotel, Detroit, Mich. H. E. Foreman, Managing Director, Munsey Bldg., Washington 4, D. C.

March 3-7—ASCE Convention
New Orleans Convention, American Society of Civil Engineers, St. Charles Hotel, New Orleans, La. Don P. Reynolds, Assistant Secretray, 33 W. 39th St., New York 18, N. Y.

March 3-7—ASTM Meeting
Spring Meeting and Committee Week, American Society for Testing Materials, Hotel Statler, Cleveland, Ohio. C. L. Warwick, Executive Secretary, 1916 Race St., Philadelphia 3, Pa.

March 19-21—N. Y. Highway Engineers
Annual Convention, New York State Association of Highway Engineers, Hotel New Yorker, New York, N. Y. Convention Secretary, Harry Spitzer, Box 38, State Office Bldg., Babylon, Long Island, N. Y.

April 1-4—New York Safety Meeting
Annual Convention, Greater New York Safety Council, Hotels Statler and New Yorker, New York, N. Y. Paul F. Stricker, Executive Vice President, 60 E. 42nd St., New York 17, N. Y.

April 7-9—Lubrication Meeting
Annual Meeting and Lubrication Show, American Society of Lubrication Engineers, Hotel Statler, Cleveland, Ohio. W. F. Leonard, Secretary, 343 S. Dearborn St., Chicago 4, Ill.

Film on Extruded Aluminum

A film on the use of extruded-aluminum parts in building products, trucks and trailers, bridge railings, pipelines, etc., has been released by Reynolds Metals Co., Louisville, Ky.

"The Shape of Things to Come" is a 16-mm sound-color movie and runs for about 30 minutes. In the course of a pictorial tour through the company's aluminum extrusion mill at Phoenix, Ariz., the process of extrusion is shown from the heating of an aluminum billet to its final emergence through a die opening. Animated sequences show production methods.

The film will be loaned to technical societies, schools, colleges, and other interested groups without charge. It is also available for individual showings to industrial companies. For bookings, write Motion Picture Dept., Reynolds Metals Co., 2500 S. Third St., Louisville 1, Ky.

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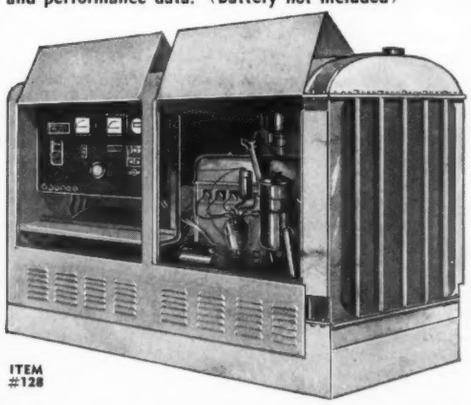
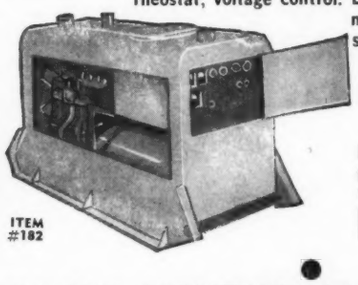


ITEM #128

ITEM #128—25 KVA-250 Volt, 3 Phase—120 Volt, Single Phase—60 Cycle—A.C. Totally enclosed—Hobart generator driven by a GMC 270, 6-cylinder gas engine, button start, liquid cooled. Has control panel with full set of instruments for both engine and generator. (Battery not included). Shipping weight 2600 lbs. F.O.B. Chicago 2250.00

ITEM #180

ITEM #180—15 KW—127/220 Volt—60 Cycle A.C.—3 Phase 1800 RPM. Brance & Krachy Generator direct coupled to International Harvester 4-cylinder, water-cooled engine with magneto ignition—push button start. Panel has voltmeter, ammeter, 4-wire electrical system, belt-driven excitor generator, rheostat, voltage control. Engine and generator mounted on steel skids. Shipping weight 2000 lbs. F.O.B. Chicago. 1650.00



ITEM #182

ITEM #182—5KW—120/240 Volt—52.5 Amp.—60 Cycle AC—Single Phase Onan generator direct coupled to Willys Jeep, 4-cylinder, water-cooled engine, with push button start, battery ignition. Has provisions for remote starting and stopping. Use standard 6-volt car battery. (Battery not included). Shipping weight 1200 lbs. F.O.B. Chicago 795.00

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Slows Grass Growth, Lowers Mowing Costs

New Growth-Inhibiting Chemical, Maleic Hydrazide, Shows Promise as Roadside Maintenance Cost-Cutter

• ROADSIDE development men heard some good news at the 37th Annual Meeting of the American Association of State Highway Officials in October. A new chemical known as maleic hydrazide has shown promise, in the test stage, as a grass-growth inhibitor, and it may well slash mowing costs.

Dr. J. W. Zukel, Biologist of the Naugatuck Chemical Division, U. S. Rubber Co., Naugatuck, Conn., reported the results of the tests, which were conducted in cooperation with the Connecticut State Highway Department.

MH—What Is It?

The synthesis of maleic hydrazide, Dr. Zukel said, was first reported in 1895, and its growth-inhibiting effect on grasses was first observed in 1949. In pure form it is a white crystalline material slightly soluble in water. Properly formulated to secure optimum response, the compound is not irritating to the operator, and it can easily be flushed out of spray equipment with water. Its effect on grasses and plants is attributed to an antagonism of naturally occurring plant growth hormones.

Aims of Tests

The experiments with MH were conducted on the median and roadside areas of the Wilbur Cross and Merritt Parkways in Connecticut, using various formulations of the sodium and diethanolamine salts of MH. Grasses on the median were predominantly fescue, redtop, and clover; and along the roadside, witch grass, timothy, foxtail, and fescue. In all, 55 plots comprising 74 acres were sprayed between August, 1950, and October, 1951. Experimenters hoped to learn whether MH was a practical method of inhibiting grass growth and lowering mowing costs; when to apply it, and in what dosage; and what equipment to use.

Results of Tests

Here are the conclusions and suggestions for treatment which the test results support:

1. MH offers promise as a temporary grass-growth inhibitor on highway areas.
2. In the spring, at the start of the growing season, apply it at the rate of 2 or 4 pounds per acre to medians, and 4 pounds per acre along guardrails and roadsides.
3. During the rest of the year, use a treatment of 4 pounds per acre for both medians and roadsides.
4. The optimum time of treatment has not been fully evaluated, but the most pronounced response at minimum dosage resulted when the test applications were made at the start of the growing season in early May.
5. If weeds such as plantain or carrot are present, dosages of 2,4-D should be included with the MH spray.
6. Since the effects of retreatment have not been fully evaluated, MH should not be applied more than once during the same growing season.
7. It is better to apply it to uncut grass to give a large absorption area of green foliage. A week should be allowed before mowing to give the chemical time to be absorbed and reach the roots of the plant.
8. Spray medians at the rate of 40 gallons of liquid per acre from a 10-nozzle boom delivering 50 pounds of pressure.
9. Spray roadside and guardrail areas at the rate of 50 gallons per acre, with a single nozzle delivering a fan spray at 50 to 200-pound pressure.
10. Several factors need further evaluation: effect of dosage on the winter survival of various grasses, effect of retreatment during the same season and in successive seasons, optimum dosages, and the time of year for the best inhibition of various grass species.

Test Procedures

On August 23, 1950, two 0.1-acre median plots were sprayed with 4 and 8 pounds of MH per acre, with low-pressure low-volume apparatus. Two similar roadside plots were treated with 8 and 16 pounds per acre. The 4-pound treatment saved 5 mowings to the end of the season, and the sprayed plot equaled the check plot in appearance. The following spring and summer the 4-pound plot was green and vigorous. The 8 and 16-pound treatments inhibited growth but produced some browning of the grass; they also showed some thinning effect, though the plots filled in later in the summer. There was no evidence of residual effect of MH in the soil.

On May 2 and 3, a dozen 1-acre plots were sprayed with 2 and 4 pounds of MH per acre. The equipment used was a hydraulic sprayer which operated at 400-pound pressure and delivered 50 gallons of water per acre at 12 mph. The specially designed nozzle threw a fan spray over a 10-foot swath. Results, three weeks later, were discouraging, and both the treated areas and the untreated check areas were mowed on May 23. But a month later, maintenance workers reported that regrowth on the treated median plots, as compared with the check plots, was markedly inhibited. Interest picked up.

The researchers found that all treatments on the median had inhibited growth, but the 2-pound treatment (MH diethanolamine salt specially formulated with wetting and sticking agents) gave the most effective inhibition. The sprayed plots had to be mowed only 2 times during the season, whereas adjacent check plots were mowed 19 times. Thus the treatment saved about $70 per acre per season over the labor and equipment cost of mowing the checks 17 times. The grass on the treated plots equaled in appearance the grass on the untreated plots throughout the season.

However, wild carrot and narrow-leaf plantain on the plots were less inhibited than the grasses. So further experiments were conducted in June,

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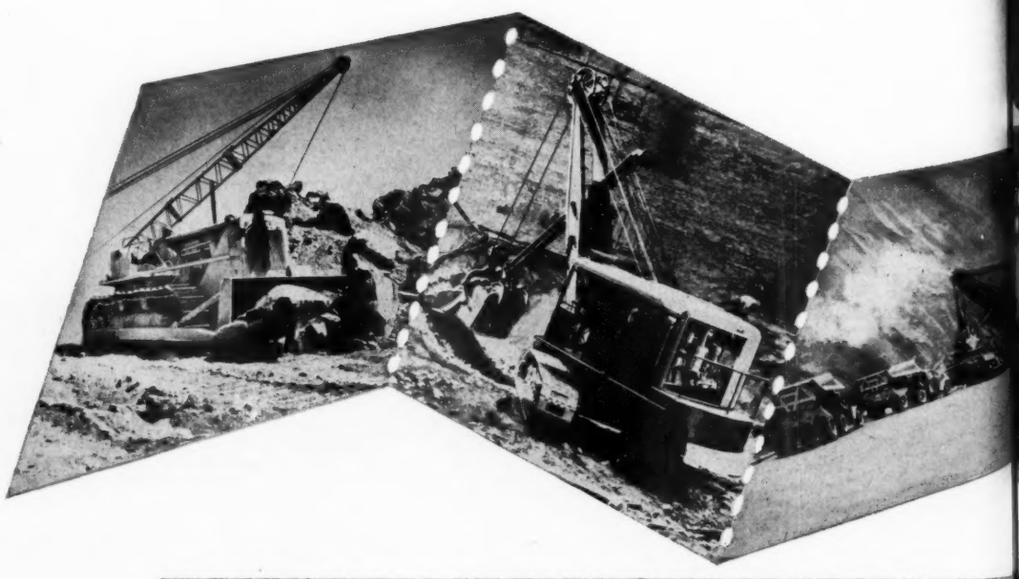
LONGER ENGINE LIFE
because this lubricating oil also
CLEANS ENGINES
—and keeps them clean!



- No more lacquering of pistons, cylinders, valves.
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- With TENOL, engines stay clean—free from harmful sludge and carbon.
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- Low oil consumption with full power, with TENOL.
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At left, a 10-nozzle boom sprays maleic hydrazide plant-growth inhibitor on a Connecticut median at the rate of 40 gallons of liquid per acre at 50-pound pressure. At center and right, roadsides get 50 gallons of liquid per acre at 200-pound pressure from a single nozzle delivering a fan spray.

July, and August, using a mixture of 2,4-D (1½ to 3 pounds per acre) and MH (4 pounds per acre) to control these weeds. Results indicated that 3 pounds of 2,4-D in the MH spray effectively controlled the weeds.

As for the roadside areas that had been treated in May with 2 pounds of MH, there was no inhibition even after mowing. But a 4-pound treatment (sodium salt of MH containing a wetting agent and a sticker) inhibited grasses for three months. The grass in the treated plot remained at a 10-inch height, whereas the check grew to 45 inches. During further treatments from June through October, 60 per cent of the treated plots showed good inhibition at the 4-pound dosage level.

In these later tests, the volume of liquid per acre and the pressure and nozzles of the spraying equipment were varied. For spraying on medians, the most satisfactory apparatus was one that applied 40 gallons of liquid per acre (minimum) at 50-pound pressure from a 10-nozzle boom. For roadside spraying, best results were obtained with a minimum application of 50 gallons of liquid per acre, at 50 to 200-pound pressure, from a nozzle mounted to deliver a 10-foot swath over the guardrail and along the roadside.

Here are some more of the results obtained. A 4-pound spray applied to 8 acres of roadside on June 5 inhibited grass satisfactorily, but 3 mowings were needed to check weed growth. Check plots were mowed 6 times during the season.

A spray applied to 2 acres of median on July 27 saved 7 mowings to the end of the season. Treated grasses were 1½ to 2 inches high while grasses in adjacent check areas were 7 to 8 inches high on October 2.

A spray of 4 pounds of MH plus 3 pounds of 2,4-D on August 7 eliminated weeds on 2 acres of roadside and inhibited grasses to a 5-inch height by October 2—grass in the adjacent untreated controls was 8 inches high.

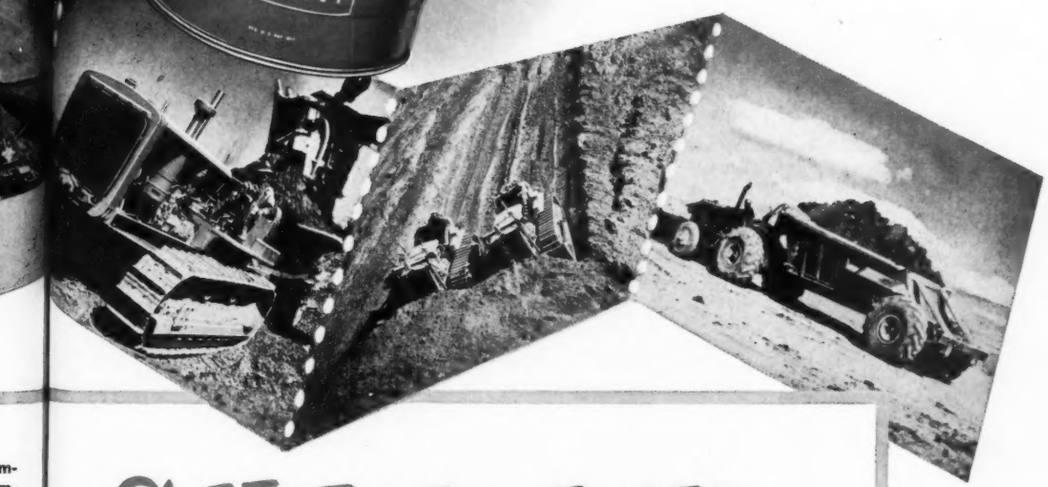
"Although it is still too early to draw any over-all conclusions," Dr. Zukel said, "the results of this year's experiments have been highly gratifying. We hope that our experiments will be extended to other states throughout the nation next year."

Automobile Statistics

The Automobile Manufacturers Association brought out last October the 1951 edition of its yearbook "Automobile Facts and Figures".

This year's edition—the 31st in the series—shows the spectacular growth of United States highway transport. In 1918, the year covered by the first edition, the nation produced 1,154,000 motor vehicles, as compared with 8,003,000 in 1950. The yearbook covers statistics of passenger-car, motor-truck, and motor-coach output; registration of motor vehicles; export of vehicles; gasoline consumption; mileages driven; taxation of vehicles; and many other details. Diagrams clarify the statistics, and photographs illustrate the various uses of the passenger car.

"Automobile Facts and Figures" may be obtained from the Automobile Manufacturers Association, New Center Bldg., Detroit 2, Mich.



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SINCLAIR TENOL
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The world's largest underground garage is now under construction in Los Angeles' Pershing Square. Here Casey & Case Foundation Co. sets its California earth-boring rigs to work along the Olive Street side, drilling caissons for the precast-concrete sidewall sections.

Underground Garage Has Precast Walls

Precast Sections Are Placed In Drilled Caissons Prior to Main Excavation to Prevent Caving; Tied Into Building

By CHARLES A. McMAHON,
Assoc. M., ASCE,
General Project Superintendent,
Los Angeles Parking Garage

• "BRILLIANT engineering."
"It's something new, isn't it?"
"Incredible!"
"Best damn trick I ever saw!"

Those are a few of the enthusiastic comments engineers and construction supervisors make when they view for the first time the unusual design of the world's largest underground garage, now under construction in Los Angeles' Pershing Square. City Park Garage, Inc., with Ford J. Twaits as President, will operate the $5,000,000 structure. Prime contractors include Ford J. Twaits Co., Morrison-Knudsen Co., Inc., and T-S Construction Engineers, Inc. When the big triple-substory building is completed, there will be room for the storage of 2,000 more automobiles in the heart of the city.

Stiles Clements, Associated Architects and Engineers, working with Murray Erick Associates, Consulting Engineers, perfected the unique design with its special precast sidewalls. Credit for the speed of construction goes not only to the designers, but also to the improved drilling equipment and the know-how of Casey & Case Foundation Co., which subbed the caisson-drilling part of the sidewall work.

Each drill rig averaged a completed hole 30 to 35 feet deep and 72 inches in diameter every 8 working hours—and that was in tough formations.

The design calls for heavily reinforced precast-concrete sections, set 9 feet on centers in drilled caissons prior to the excavation of the main earth prism, and tied in as a permanent part of the building in later construction stages. These special sections, set in undisturbed ground, acted as buttresses to hold the tricky sides in place. Without exception, caving was prevented all along the perimeter of the 350 x 600-foot hole, which was 30 feet deep. Four major Los Angeles city streets continued to carry their normal traffic undisturbed, and what could have been a staggering expense for sheet-piling the hole was saved.

Design

The garage is bounded by Fifth and Sixth, and Olive and Hill Streets. It is a reinforced-concrete structure, with a modified flat-slab floor system. This system includes a typical interior floor section 5½ inches thick in the middle third of 27-foot spans, with a straight-line variation to a thickness of 16½ inches on a 4-foot square centered on the 26-inch-diameter column. The heavily loaded roof section has a typical thickness of 9 inches in the middle third and 27 inches over the column. Concrete in the roof is designed for a

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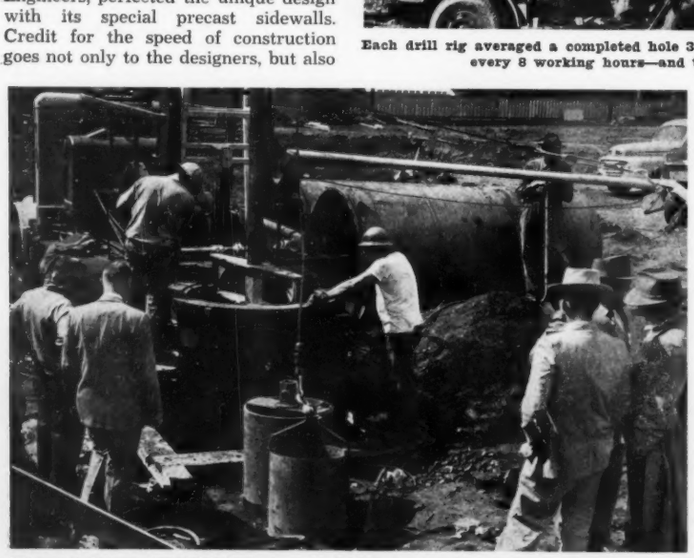
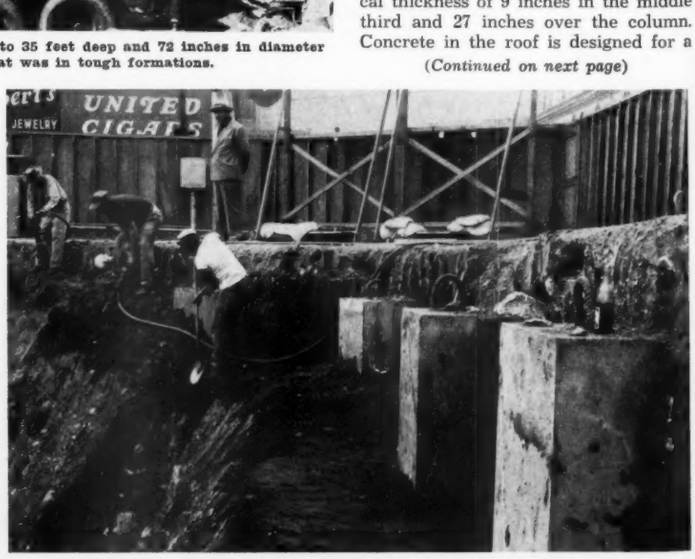


When a hole was completed to grade, a telescoping steel casing was installed to protect the sides. This had to be plumbed to no tolerance. Then a footing was trimmed and poured, and the 9½-ton precast-concrete section installed on the footing.



Here are some of the precast sections in place, with the casings removed and the backfill in. This design prevented caving all along the perimeter of the 350 x 600-foot hole, and saved what could have been a staggering cost item for sheet-piling the hole.

compressive strength of 4,000 psi at 28 days. All remaining concrete is 3,000-psi.

Six circular ramps will permit automobiles to enter or leave the garage so efficiently that the structure can be emptied in 27 minutes. Four of these ramps are on the Hill Street side; two are on Olive Street. All car movements in and out of the garage will be in line with existing street traffic. This will make for the least possible interference, and eliminate the problem of dumping cars out into the street at right angles to the direction of flow. All automobile ramps leading to the circular interchange will pass under the sidewalks, thus avoiding the possibility of collision between automobiles and pedestrians. It is an enormous contribution to safety.

A Big Drilling Job

The designers and the prime contractors realized the importance of installing the precast sections with no disturbance to the ground if possible. So they subcontracted this part of the work to a specialist, Casey & Case Foundation Co. It was a big and important part of the contract. There were 208 such sections to install to enclose the sides of the garage ahead of excavation. Casey & Case turned in a remarkable performance, for in spite of all kinds of unfavorable digging, each drilling rig the company assigned to the project averaged a completed hole from 30 to 35 feet deep and 72 inches in diameter every 8 working hours. That included moving, setting up, and all the drilling items.

Casey & Case used four standard-model California earth-boring machines, including two Model 100-A's and two 150-A's, largest in the line. This earth-borer is a bucket-type rotary drill, made in Los Angeles by California Welding & Blacksmith Shop. The 100-A, for example, is a large, heavy-duty rig capable of sinking a 72-inch hole 200 feet deep, if necessary. Its main engine delivers 100 hp, and power is transmitted to the oil-tempered plow-steel bucket knives through a 3-inch kelly bar, capable of digging 22 feet deep without extra drill stems. The Pershing Square machines had 4-speed heavy-duty transmissions to give a wide range of drilling speeds.

In the old days of the padres, Pershing Square had been a swamp. Gradually, over the years, the area had been filled with almost every type of refuse. Casey & Case encountered such tough formations as boulders, scrap iron, and virtually anything you might name which American civilization has been discarding for the last 100 years. To bore holes under these conditions and leave the ground undisturbed was a severe test of any drilling equipment.

The 72-inch-diameter holes went down first on 27-foot centers. Then the machines dropped back and put in a line of alternates, 9 feet from the first holes. The third pass closed up the remaining 18-foot gap, making the caissons 9 feet center to center. Meanwhile, the installation of precast-concrete sections helped to hold the ground.

Drilling was done by moving the machines into position, raising their derricks, and boring a pilot hole 28 inches in diameter to grade. The reamer was

(Continued on next page)

Once the sidewalls were in, the 250,000-yard excavation proceeded as a shovel-and-truck operation—much of it at night when the city traffic was light. C. G. Willis & Sons was the subcontractor.

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Underground Garage Has Precast Walls

(Continued from preceding page)

then attached to the bucket and the hole was quickly enlarged. As the reaming blades dislodged the dirt, the material dropped into the bucket where it could be easily removed. With the side reamer in position, one of the large machines had to move as much as 0.25 cubic yard of earth per minute to maintain its daily run of completed hole. This it was able to do.

When a hole was completed to grade, a telescoping steel casing was installed to protect the sides. Only a few of these went in before the drillers realized what a problem they had on their hands. Because of the precast sections which were to go in, the steel casings had to be plumbed to no tolerance; in other words, the large-diameter drill holes had to be perfectly straight.

By using care, the drillers were able to satisfy even those demands. Heavy-duty screw jacks on the drill outriggers set the machines to hair-trigger level before they started the hole. When large boulders or other debris were encountered, the drillers took a little time to work the obstruction loose and get it out of the way. When the telescoping casing was set in place by a Bucyrus-Erie 38-B crane, it went in properly because the holes were accurate.

Following the installation of the casing, the bottom of the hole was underreamed slightly and a footing was trimmed below the bottom of the caisson. Workmen then placed a keyway form for the 3 x 1½-foot precast section, and truck mixers from a commercial source of supply came in with the footing concrete.

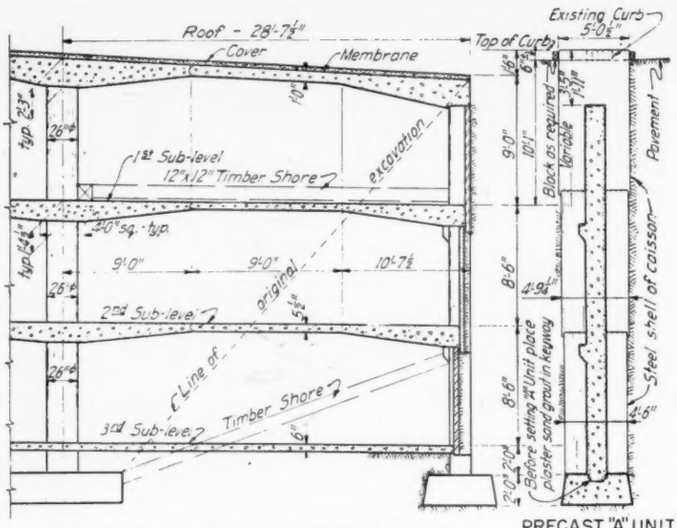
Meanwhile, the 9½-ton sections were prefabbed by C. D. Wailes Corp. of Los Angeles, and trucked to the site. The 38-B crane placed each section in position on the footing, after the keyway had been treated with plaster-sand grout. The precast sections were then aligned by a transit and braced.

Backfilling, also, was somewhat ticklish. It was done by bucketing sand and other pervious material around each section and then gently jetting this material. As backfill was installed, the bottom casing was telescoped upward, keeping the backfill at all times above the bottom part of the casing. When the casing was fully telescoped, the crane lifted it out in its entirety, and the backfill was then finished. This method left the concrete sections securely fixed in position.

Other precast units were originally designed to fit between the precast vertical columns or sections, but this plan was modified and a 5-inch wall was placed by Gunite guns. This intermediate wall serves mainly as permanent filler between the precast units.

The main block of excavation was removed by leaving a triangular prism or berm with a 1 to 1 slope, extending inward from the top of the precast sections. Excavation was a shovel-and-truck operation, done by the Los Angeles firm of C. G. Willis & Sons, subcontractor. One of the unusual features about the 250,000-yard excavation job was the fact that it had to be done at night, when traffic on city streets was light. This work went along rapidly, too, and Willis rolled 550 to 600 truckloads a night to Chavez ravine, the designated dump ground. Approximately 4,000 cubic yards of earth and debris went out between 6 p. m. and 2 a. m. Shovels included a P&H Model 655-A, a Koehring 801, and a Bucyrus-Erie 22-B drag shovel for foundation or footing excavation.

The remaining block of excavation left against the precast sections presented no special problem. Removal of the upper portion, to expose the top of the A-units, was a job for men and clay spades. The lower tiers of this block could be excavated by drag shovel and front-end tractor loaders.



TYPICAL SECTION – WALL UNITS IN PLACE

PRECAST "A" UNIT IN CAISSON

Concrete Work

The 50,000-yard concrete job is a concrete foreman's dream. Not too often, on thin slabs or columns, can a crew place 450 cubic yards in a 6-hour run, as has been done on the Pershing Square structure. The uniform and practical design has helped enormously to speed formwork and concrete placing.

All deck and round-column forms are steel, made by Robert Hiller Co. of Los Angeles. Approximately 600,000 square feet of steel forms are on the project. Shores are ordinary 4 x 4's and 4 x 8's, spaced 4 feet on centers each way. These shores are capped by 4 x 6's, and have 2 x 8 cross joists on 30-inch centers to carry the steel forms.

Concrete is supplied by truck mixers from Graham Bros., a commercial plant, and dumped to a small Gar-Bro

(Concluded on next page)

To insure lowest cost per yard moved, or ton lifted . . . compare all excavator and crane information with "KOEHRING WORK CAPACITY". Your Koehring distributor has specific figures that will let you prove for yourself the biggest profit-earning value.
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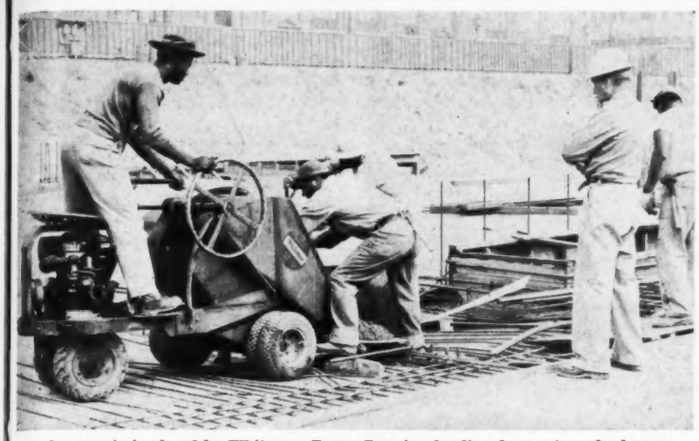
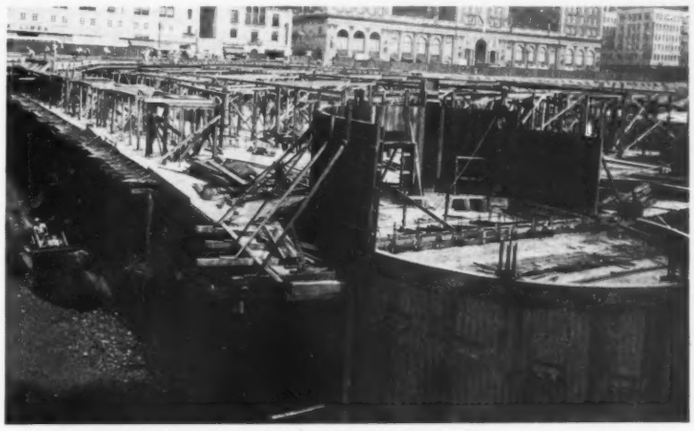


Deck concrete is placed by Whiteman Power Buggies, hauling from a transfer hopper.



The top level of the new garage had just been reached when this picture was taken.

surge hopper, where five Whiteman Power Buggies cart it over wood runways to the point of placement. Placing and vibration are then done by conventional methods. The floors have neither expansion nor contraction joints. As a rule, the construction joints which have to be formed at the end of a day's work make the pours about 80 x 105 feet. Sealtex membrane and water-sprinkling cures are used, and final finishing is done by Whiteman power trowels.

Personnel

R. H. Kirkman is Project Manager and the writer, C. A. McMahon, is Project Superintendent. Howard Thompson was in charge of the ticklish drilling for Casey & Case Foundation Co.

According to Architect Stiles Clements, the use of the special side design is economical and utterly practical anywhere in the world where conditions are similar to those at Pershing Square.

Fills a Critical Need

The need for a modern underground parking garage in the Los Angeles Civic Center area has been critical for years. Several planning surveys made in 1928, 1931, and 1932 pointed to Pershing Square as the ideal parking site. An open parking area was out of the question in Pershing Square, because that area from long usage has become the Boston Commons of the west coast—a meeting place where people can rest and relax. Nothing definite was done until 1945, when the Downtown Business Men's Association started the studies from which the structure has now resulted.

The first call for bids, in 1949, attracted not a single builder. However, at the request of the Downtown Business Men's Association, several firms made written statements that they would bid if given a second chance. In 1950, bids were again advertised. The only bid, and the successful one, was submitted by the present joint-venture firms.

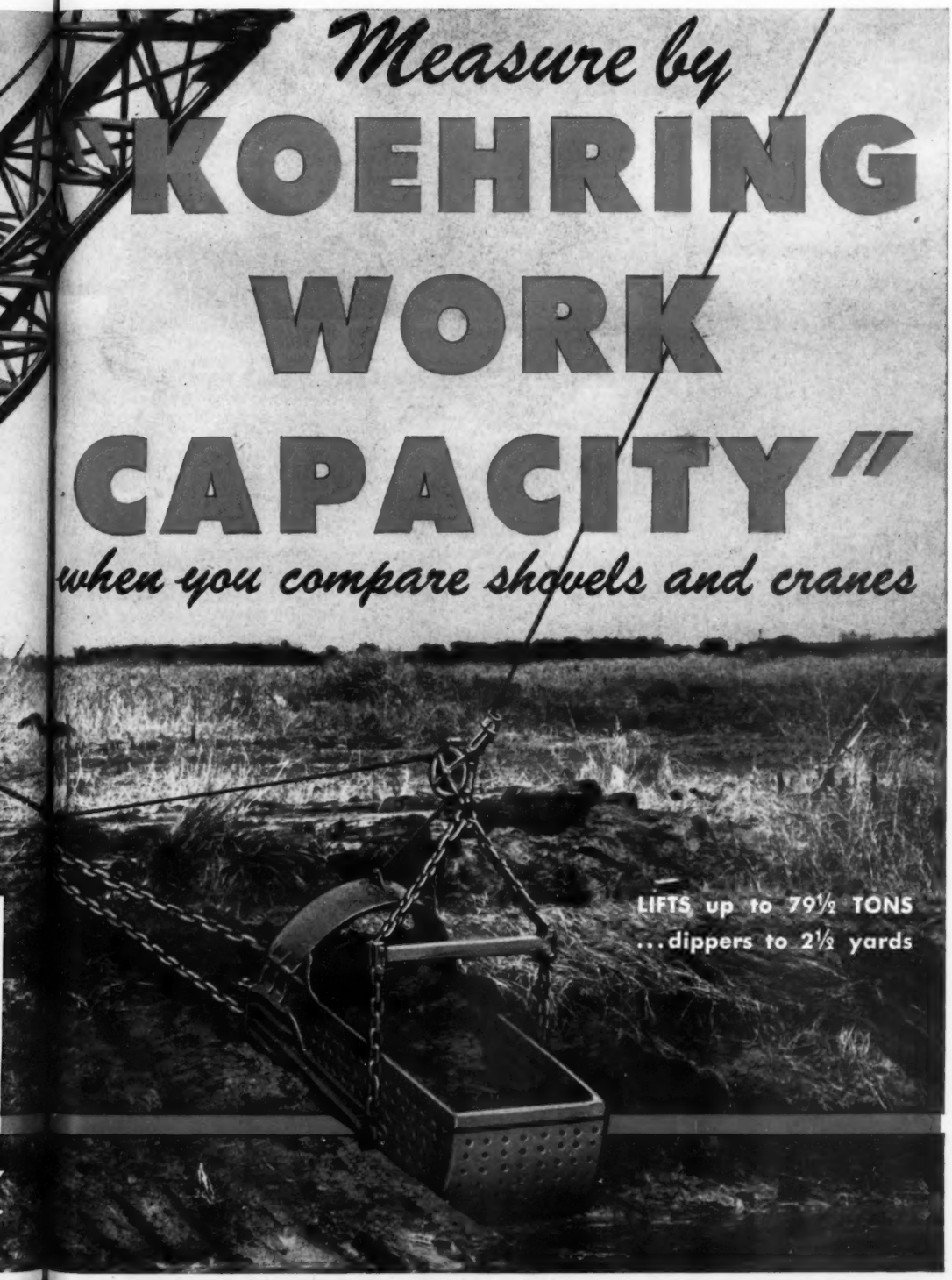
Direct financing was accomplished by a first-mortgage loan from the Equitable Life Assurance Society, a second-debenture-mortgage bond sale to local business interests, and the purchase of common stock by the City Park Garage syndicate. A total of $250,000 of second-debenture bonds were purchased by downtown business and property owners. City Park Garage, Inc., will operate the property for 50 years, turning it back to the City of Los Angeles after that time.

Data on Joint Cleaner

A circular on the Model G concrete-grooving and joint-cleaning machine has been released by G. H. Tennant Co., 2530 N. Second St., Minneapolis 11, Minn. It explains that the unit cleans joints for resealing; routs out cracks; removes extruded material; scores surfaces to aid traction; levels pavement humps; erases traffic lines; and cuts grooves for new topping.

The catalog points out that the machine can be adapted for cleaning cracks and joints of all widths up to 4¼ inches. Its features listed in the circular include a 13-hp air-cooled engine, a push-button starter, semi self-propelling action, interchangeable cutters and cutting heads, a simple arrangement for controlling width and depth of cut, and portability.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 194.



Handbook and Text On Pile Foundations

A new book packs within its covers the essential information required for designing, driving, and maintaining pile foundations. Robert D. Chellis, C. E., Structural Engineer, Stone & Webster Engineering Corp., is the author of "Pile Foundations — Theory, Design, Practice".

This combined handbook and text provides the data needed for economical and efficient design and handling of pile foundations. It also covers the principles of soil mechanics, methods of determining pile capacities from driving resistances, and methods of selecting piles and types of equipment. The author evaluates throughout the text the comparative features of wood, concrete, and steel for pile foundation work. He gives a good deal of attention to the protection of piles, methods of preventing failure, and remedies for deteriorated structures. He also discusses developments in diesel hammers, prestressed-concrete piles, sand drainage, and Prepakt concrete.

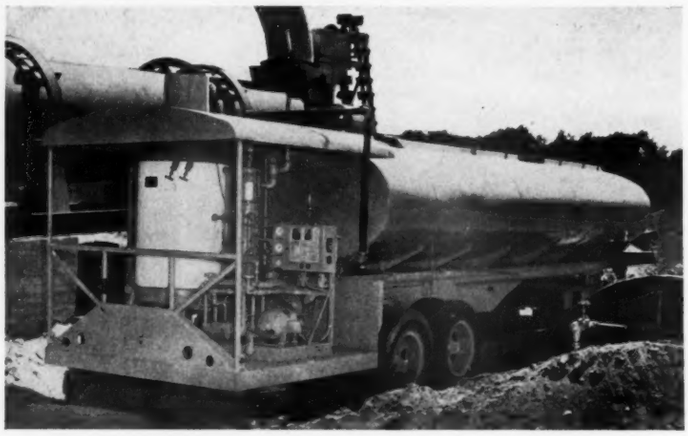
The book tabulates properties of all American and British hammers, extractors, piles, and sheet piling. It lists standard specifications of leading technical societies and associations, leading manufacturers of piles, and piling contractors. It quotes portions of the leading codes affecting piling.

The 681-page text is fully illustrated and has an extensive bibliography. It is published by McGraw-Hill Book Co., 330 W. 42nd St., New York 18, N. Y. Price is $12.50.

Big Steam Generator Rolls Right to Site

A completely portable steam-generator and tank unit was used by United Concrete Pipe Corp., Baldwin Park, Calif., to enable faster and simpler moving of the company's portable asphalt plant.

The combination unit consists of a 3,600-gallon storage tank divided into three compartments (1,800 gallons of water, 650 gallons of diesel fuel, and 1,150 gallons of fuel for the dryer) and a 100-hp Clayton forced-recirculating steam generator mounted at the rear of the tank semitrailer. It also includes a motor-driven dryer fuel pump and the necessary piping to handle various fluids and deliver them to the Madsen asphalt plant. Madsen, incidentally, made the recommendation concerning the unit.



To speed up moving its portable asphalt plant, United Concrete Pipe Corp. uses a combination unit of a Clayton 100-hp steam-generator and a tank trailer.

The combination unit is constructed so that when it arrives on the job it is only necessary to run the steam line to the plant and dryer. The company says that the generator is ready to operate within 5 minutes after hookup. Condensates from the jacket can be returned to the water storage tank for re-use.

How to Run a Motor Grader

Another of Caterpillar's informative colorful handbooks about equipment operation is "on the stands". The 12-page cartoon-style booklet outlines the various adjustments and techniques for the operation of a motor grader. It points out that the motor grader can do a variety of jobs and particularly lends itself to skill on the part of the operator. The methods outlined in the booklet were presented by operators of long experience and are suggested as working standards.

This literature may be obtained from Caterpillar Tractor Co., Peoria 8, Ill., by requesting Form 30228, or by using the Request Card at page 16. Circle No. 169.

FOUNDATION CONSTRUCTION

CAISSONS SHAFTS

DRILLED AND UNDERREAMED

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Why the LIMA Type 604 develops the greatest capacity per lb. of weight

Main machinery of LIMA Type 604, showing position with relation to center of rotation.
← CENTER OF ROTATION

Lima Type 604 Shovel equipped with a 23 ft. boom, 18 ft. dipper handle and 1½ yard dipper. Note that more than 2/3 of the cab and all of the main machinery are well back of the center line of rotation for maximum counterbalancing effect.

● The LIMA Type 604 shovel, crane and dragline is engineered to produce greatest capacity with minimum weight. This is achieved by placing as much weight as possible *behind* the center of rotation—eliminating the need for excessive counterweight. Hook rollers on which the machinery base revolves eliminate strain from the center pintle—permitting continuous, safe operation at full capacity.

The simple, compact design of the main machinery, using the fewest number of shafts to accomplish the various operations, further contributes to efficient, trouble-free service.

These are only a few of the features which make the LIMA 604 a favorite with owners and operators. The Lima Line includes shovels ¾ to 6 yards, Cranes 13 to 110 tons and Draglines variable.

BALDWIN-LIMA-HAMILTON CORPORATION
LIMA-HAMILTON DIVISION
LIMA, OHIO, U. S. A.

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SALES AGENTS IN PRINCIPAL CITIES OF THE WORLD

BALDWIN-LIMA-HAMILTON

This is the Hot-R-Well, a space heater with an output of 200,000 Btu per hour.

New Space Heaters

A space heater with an output of 200,000 Btu per hour is announced by Master Vibrator Co., 108 Davis Ave., Dayton, Ohio. The Master space heater can be used for general heating; thawing of material, equipment, or working areas; space or spot heating; and for drying construction work. It is mounted on rubber-tired wheels for quick portability and weighs 265 pounds.

The heater is said to provide instant heat, as it requires no warmup period. It burns kerosene or No. 1 or No. 2 fuel oil at the rate of about 1½ gph. The hot-air output is about 1,000 and 1,200 cfm and the air is directed downward toward the floor by special louvers. The heater is provided with an automatic shutoff. Thermostatic controls are available as extras. According to an accredited testing laboratory, it is non-hazardous with carbon monoxide discharge air content of only .001 per cent or less.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 163.

New Water Repellent

An invisible fast-curing water-repellent silicone for masonry surfaces has been developed by Dow Corning Corp., P. O. Box 592, Midland, Mich. This new silicone resin, XR-129G, is said to have many desirable features: it keeps rain from wetting and penetrating the pores of masonry; it resists the efflorescence and staining of the masonry; it has an effective life span of about five years under normal conditions of exposure; it does not affect the color or surface texture of the area coated; and it is easy to apply by brush or spray. The company points out that this particular type of silicone treatment coats only the lining of the pores, allowing the masonry to breathe freely.

Dow Corning does not manufacture the masonry water repellent. It only supplies the silicone resin to formulators of repellents. Data on this new product, however, and lists of formulators and suppliers may be obtained from the company. Or use the Request Card at page 16. Circle No. 205.

Makes Tires in Japan

Goodyear Tire & Rubber Co., Akron, Ohio, will manufacture and sell in Japan tires and other products. Goodyear Japan, Ltd., is the name of the new Far Eastern company. Its main offices are in Tokyo, but production operations will be at Kurume, Japan, and will be carried on under contract with the Bridgestone Tire Co., a Japanese concern and the largest producer of tires in the Orient. R. W. Hadley, formerly Managing Director of Goodyear's Far Eastern Division, is Managing Director of the new company, and H. B. Puckett, Secretary-Treasurer. Goodyear's Production Manager at Kurume is J. J. Hartz, formerly Manager of Product Development Compounding for the company in Akron.

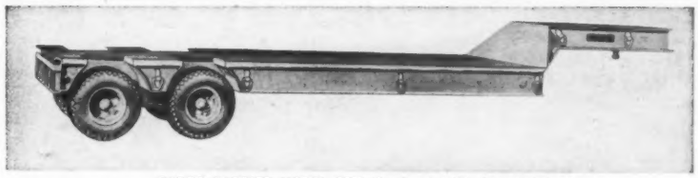
Manufacturing operations are to get under way as soon as equipment can be readied and personnel trained. All products manufactured for Goodyear at Kurume will be according to the company's specifications and will bear the Goodyear brand name.

Offset Ladder Bracket

A circular describing a combination offset ladder bracket and scaffold bracket has been prepared by Steadfast Equipment Co., 874 Franklin Ave., Thornwood, N. Y. It points out that this unit may be easily slipped on any standard ladder with no intricate adjustments, and that the bracket arms are always level when the ladders are placed at the proper pitch. As a scaffold support, the bracket can be attached to either the inside or outside slope of the ladder. The circular describes and illustrates the various uses for this unit and provides complete specifications.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 143.

SOLVE YOUR HAULING PROBLEMS WITH
A "TRANSPORT TRAILER"
Capacities through 75 Ton—Semi and Full Trailers



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PATENTED TANDEM AXLE ASSEMBLY—Featuring unusual lengthwise and sidewise wheel accommodation to irregularities in the road. Use of full width tubular forged, heat treated axles with CAMBER.

FRAME—Constructed of beam sections throughout, electric welded. A ruggedly strong and efficient unit with minimum weight.

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Now as to quality: SEAMAN-mixed bases are stronger. Binders are thoroughly, evenly and more scientifically mixed; coarse aggregates and fines more uniformly keyed and blended to give perfect control of voids. Core samples prove it. And, that means a higher resistance to the pounding of traffic and deterioration from weather.

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And that is why you as a highway official can make your '52 budget go many miles farther for better road construction. And you, Mr. Contractor, can speed up your 1952 schedules and sharply cut your costs.

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282 N. 25th ST., MILWAUKEE, WISCONSIN

Mile-Long Bridge Widened by 8 Feet

New Concrete Piles Are Cast and Driven, One at Each Bent, To Improve Deck on North Carolina Span

• ONE of the major bridge projects now under way in North Carolina is the reconstruction of the 1½-mile-long span over the Chowan River on U. S. 17 (the Coastal Highway) between Edenton and Windsor. The 25-year-old structure, part in Chowan and part in Bertie Counties, with a total length of 7,921 feet 6 inches plus or minus, had a 200-foot swing span and 389 concrete pile bents on 20-foot centers.

Each bent contained three octagonal-cross-section reinforced-concrete piles, 18 inches in diameter, spaced on 7-foot 7½-inch centers. The center pile was plumb, while the two outside piles were battered inward. They supported a concrete cap which had a minimum depth of 2 feet and was 2 feet 2 inches wide x 19 feet long. Over the caps was a timber superstructure with a roadway only 18 feet wide.

Such a narrow roadway was inadequate and unsafe for a busy highway carrying heavy truck traffic north and south along the eastern seaboard. Vehicles had to slow to a crawl over the timber decking, which required constant and costly maintenance. Accordingly, the North Carolina State Highway and Public Works Commission awarded a contract for the reconstruction of the bridge to the Bowers Construction Co. of Raleigh, N. C., on its low bid of $1,457,729. Pile casting got under way in April, 1951, and the contract is scheduled for completion by the middle of 1952.

C. & E. M. Photo

The Chowan River bridge deck before widening. This is the 3-pile concrete bent and cap which supported the narrow superstructure. A new pile has now been driven 7 feet 7½ inches away from the old outside pile at each bent.

New Superstructure

Reconstruction involves removing the timber superstructure and replacing it with one of steel and concrete, designed with an assumed roadway live load to H15-S12(44) AASHO specifications. The old 18-foot roadway is being replaced with one having a 26-foot clear width. Widening is done on the downstream side by driving a precast RC pile in line with each bent, 7 feet 7½ inches away on centers from the existing outside pile. Like the old, the new piles are also 18-inch-diameter octagonal-shaped, and are driven on a batter of ¾ inch to the foot.

With the new pile in place, the existing 19-foot caps are extended 7 feet 3 inches to a new length of 26 feet 3 inches. These caps support a superstructure of four I-beam stringers, on which is laid a 7-inch RC deck slab. Caps and the deck slabs are poured in place. Other concrete work includes the encasement of 785 existing piles for a length of 4 feet—2 feet above and 2 feet below normal water level—to protect them from disintegration. The concrete encasement of the existing 18-

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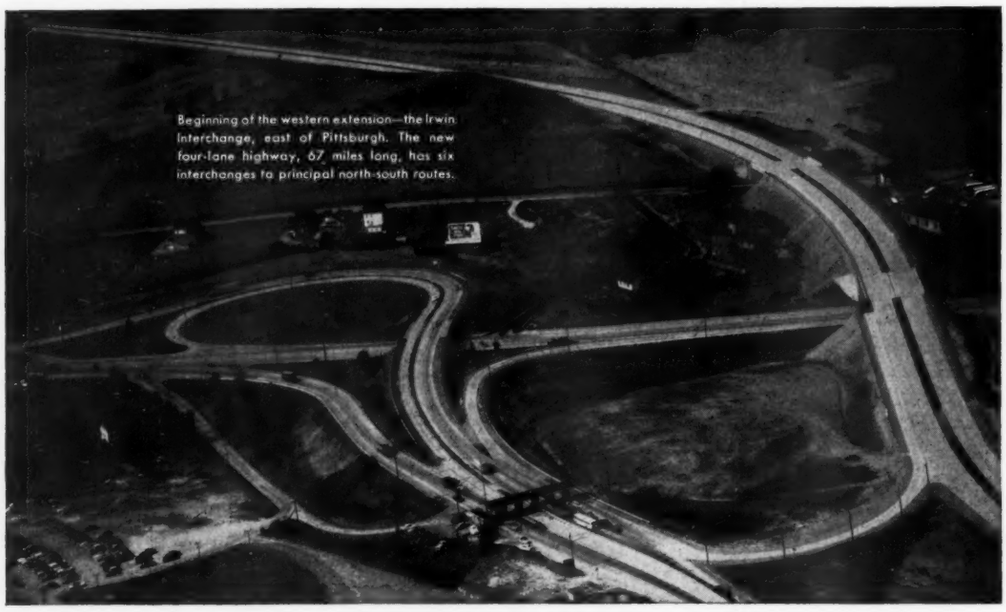
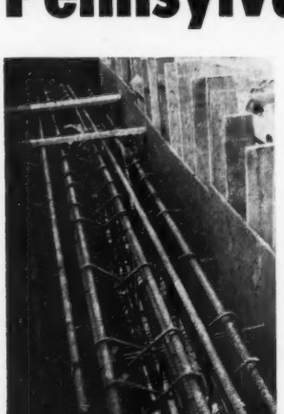


Beginning of the western extension—the Irwin Interchange, east of Pittsburgh. The new four-lane highway, 67 miles long, has six interchanges to principal north-south routes.

Pennsylvania Turnpike Goes West



F. Y. Dunn (left), resident ▶ engineer, Pennsylvania Turnpike Commission, and W. S. "Buckets" Bell (right), paving superintendent, talk over the job with Contractor Frank Mashuda.

◀ Close-up of Bethlehem Reinforcing Bars installed in bridge. Bars have high, closely-spaced lugs to prevent slippage in concrete.

▼ Graded surface is dampened before first-course pouring. Bethlehem Dowel Unit, in foreground, keeps dowels accurately aligned in concrete, horizontally and vertically. Hook bolts visible at left.

WITH the opening of the western extension of the Pennsylvania Turnpike System, motorists now may enjoy 327 miles of uninterrupted express-highway driving from King of Prussia, near Philadelphia, to the Ohio border.

Smaller pictures here show construction on a portion of the Turnpike north of Pittsburgh. The contractor was Frank Mashuda Company, Milwaukee. Bethlehem, well represented along the entire Turnpike, supplied dowel units, bridge reinforcing and hook bolts.

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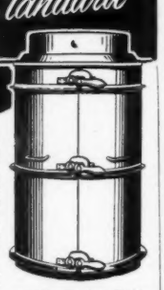

The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 35 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that Quinn pipe forms and Quinn mixing formulas combine to produce the finest concrete pipe at lowest cost.

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For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for pipe from 10" up to 120" and larger—tongue and groove or bell end pipe at lowest cost.
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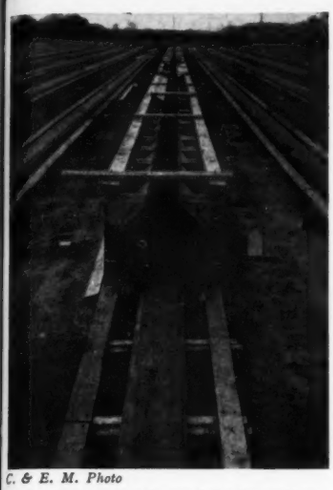


C. & E. M. Photo

The first row of forms for pile casting on the Edenton, N. C., bridge job. It is seasoning out. Later a steel cage will be placed inside.

inch octagonal piles is a 2-foot 4-inch-diameter circle, reinforced with wire mesh.

The new 210-foot swing span will be a through truss, with the trusses 31 feet 5 inches apart on centers. It will have a height of 28 feet at the center and 24 feet at the ends, measured center to center between the top and bottom chords. The structural steel in this swing span weighs 200 tons; the deck is a 3-inch steel-grid floor filled with concrete.

Construction Procedure

Casting the piles, then driving them from a floating rig, was naturally the initial step in the construction procedures. A temporary detour bridge, with an 18-foot roadway on timber trestle bents, was built 210 feet downstream from the existing bridge at the swing span, and tied back to the long river bridge. The existing 200-foot swing span was then moved to that location to provide a temporary crossing at the river channel, while a new truss was erected at the old location.

Except for that portion of the bridge within the limits of the temporary-crossing by-pass, the main work of reconstruction was carried on in two stages without interruption to either vehicular traffic on U. S. 17 or to water traffic from Albemarle Sound up the Chowan River.

In the first stage, the downstream portion of the old deck was removed, and that portion of the new deck was constructed. This was done in 480-foot sections while one-way traffic was maintained over the old upstream portion of the existing bridge. In the second stage, the remaining upstream portion of the old deck was removed, and the balance of the new deck was constructed. During this second stage, traffic was carried on the downstream portion of the new deck.

Pile Casting

Aside from the work at the bridge site, the major operation of pile casting was carried on in a rented 3½-acre field just south of Edenton on State Route 32. Although it entailed a 5-mile over-the-road haul to the northern bridgehead with the piles, the location of the casting yard was desirable in that it was on a siding of the Norfolk & Southern Railroad, thus facilitating the delivery of construction materials. The field was a former dairy-cattle pasture, and the only preparation required was dozing off the topsoil and leveling a few high spots.

The job called for the casting of 443 piles, ranging in length from 30 to 74 feet, totaling 24,222 linear feet. Enough pile beds were laid out to accommodate 7,000 linear feet of piling at a time. A total of 20 beds, each 350 feet long, were built with a clear width of 39 inches between rows. All the beds were built with permanent bases, but only one set of side forms was built at a time. Casting started at one side of the yard, and continued across to the other side. Side forms usually had to be replaced after seven pours.

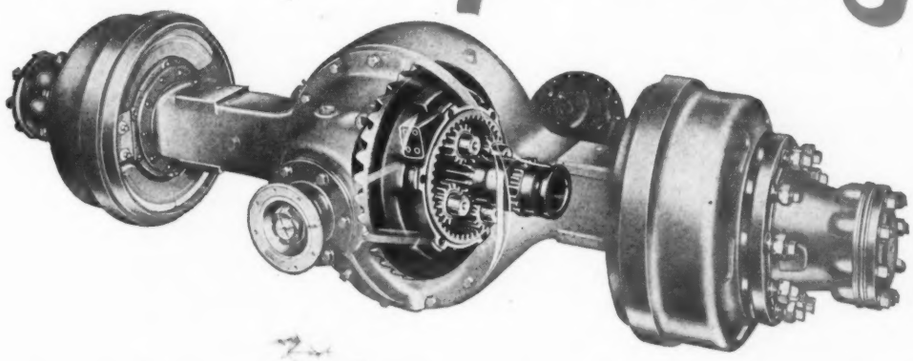
A typical base for a bed was built by driving 2 x 4's two feet into the ground on 2-foot centers in rows 26 inches apart on centers. Caps of 2 x 6's were secured to the tops of these stakes, and supported a pair of 2 x 4's laid lengthwise as a runway. Over this runway was laid the form base, 1¾ inches thick x 7⅝ inches wide, and beveled along the sides. All forms were built with pine lumber. On either side of the 2 x 4 runway pieces was a parallel 1 x 4 kicker on which rested the 4 x 4 posts of the side forms. Wedges were driven between the kickers and the side forms to bring the latter into

(Continued on next page)

C. & E. M. Photo

Here is a side view of the form row. It is made of 1¾-inch pine lumber in two half sections. Vertical 4 x 4 studs on 20-inch centers support it.

Planetary Gearing



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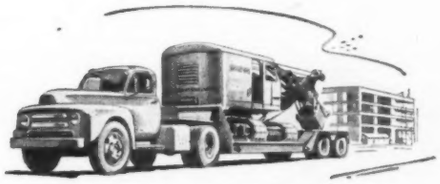

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Mile-Long Bridge Widened by 8 Feet

(*Continued from preceding page*)

proper alignment.

Sides for the pile forms were built in two half sections with 1¾-inch lumber, supported along the sides with the vertical 4 x 4 posts or studs on 20-inch centers. Across their tops, down each side, went 2 x 4 wales, joined across the top with 2 x 4 straps at 3-foot intervals. After a pile was cast the straps were knocked off the top, the wedges kicked out of the bottom, and the two side forms were ready to be moved to the next bed base.

Side forms were built in sections 14 and 16 feet long, in general, to accommodate the pile lengths of 30 feet and up. Thus in a single row nine or ten of the shorter piles, 30 feet or slightly longer, were cast at one time by joining the form sections together. For the longer piles, the number per row was naturally decreased. Side forms were also braced to the base of the adjoining rows.

C. & E. M. Photo

The Bowers batch-plant setup for the bridge job. The cement shed is at right, and an Erie AggreMeter at left. A timber platform supports three water barrels.

Materials Handling

Piles were reinforced with eight longitudinal bars, from ¾ inch to 1¼ inches square depending on the length of the pile. Around the bars went spiral reinforcing consisting of No. 7 wire. For the initial 2 feet at the butt end, the pitch of the wire was 3 inches, but for the rest of the pile the pitch was 6 inches. Reinforcing was supplied by the Virginia Steel Co. of Richmond, Va., and delivered by rail to the siding at the casting yard. The rods were unloaded from gondola cars by placing three sections of pipe with one end on the ground and one end on top of the car, and sliding the rods down to a designated position in the yard.

The steel cages were assembled by first tying the longitudinal rods together on a hanger, and then slipping the spiral reinforcing over them. The hoops were wired to the deformed bars at 2-foot intervals. Special metal jigs, cut to the cross section of the pile with holes for the rods, were used in assembling the cages. One half of the wooden form was set up first, then the steel cage was laid on the base, after which it was closed in by the other half section of form.

Sand and crushed-stone aggregate for the concrete were supplied by the Bryan Rock & Sand Co., Inc., of Neverson, N. C., and delivered by rail to the siding. The material was unloaded and stockpiled by a Northwest crane equipped with a 45-foot boom and a ¾-yard clamshell bucket. The sand was piled on one side of an Erie 3-compartment AggreMeter holding 20 yards of material, with the stone on the other. The crane charged the bins.

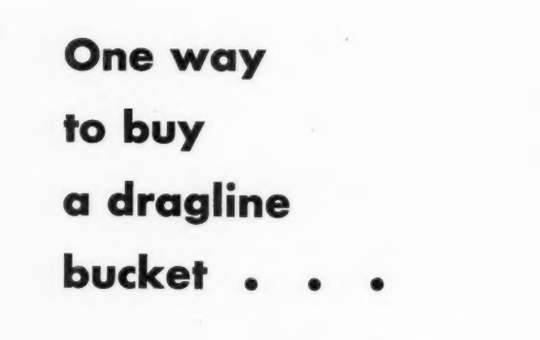
Bag cement for the job came in freight cars from the Lone Star plant at South Norfolk, Va., to the siding. A cement shed, with 3,000-bag capacity, was erected on piles with a ramp at the rear leading down to the level of the cars. The bags were transferred from car to shed with a Whiteman Power Buggy that handled 12 bags at a time up the steep incline.

Transit-Mix Concrete

All concrete for the bridge project, both pile-casting and site pours, was mixed in three Jaeger 2-yard transit mixers mounted on Ford trucks. Water for the concrete was pumped from a deep well at the casting yard by a Goulds New Pyramid electric-driven water pump into three tanks, with a total capacity of 2,000 gallons, mounted on a timber platform. The tanks were filled in 1 hour and 40 minutes of pumping. Besides the mix, the tanks also supplied the water for curing

(*Concluded on next page*)

One way to buy a dragline bucket . . . and the right way



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the concrete piles. To guard against possible power failure in the operation of the electric pump, the contractor also ran in a pipeline from a city main in Edenton, and installed a meter to measure whatever city water he might use.

A 6-bag-per-yard batch of class A concrete was used, with Darex air-entraining agent added to the mix. The transit mixers were loaded in two minutes by running under the platforms on which the aggregate, water, and cement were stored. The bags of cement were emptied by hand into a hopper directly over the trucks. As the concrete was chuted into the forms, it was vibrated with a Mall vibrator. Along the tops of the forms were 1 x 7 side pieces forming a trough, thus preventing loss of concrete by spillage during the pile casting.

Forms were removed the day following a pour, but the curing period continued for 28 days. Lengths of ¾-inch perforated pipe were strung out on top of the piles, with connections going back to the water tanks. Their high position permitted a gravity flow. Piles were painted at the pick-up points with 2-inch-wide bands. Piles under 60 feet had two such points, but piles 60 feet and over in length required three pick-up points. The longest piles, 74 feet, contained 5 yards of concrete, 3,136 pounds of steel reinforcing, and had a total weight of 10.21 tons. The 18-inch-diameter piles tapered down in 2 feet to an 8-inch diameter at the tip.

Casting took about 3½ months, but as the curing period for the piles was completed, they were picked up by winches and loaded on a pole trailer for hauling to the bridge site. There they were driven by a floating driver to a 40-ton bearing through river muck and clay into a firm stratum of sand.

Quantities and Personnel

The major items in the bridge reconstruction contract include the following:

Reinforcing steel	2,408,091 lbs.
Structural steel	2,065,000 lbs.
Class A concrete	6,970 cu. yds.
Steel-grid floor, concrete-filled	5,830 sq. ft.
Precast-concrete 18-inch piles—443	24,222 lin. ft.
Creosoted structural timber	84,625 FBM
Creosoted-timber piles—302	17,516 lin ft.
Encasement of existing piles	785 each
Untreated-timber sheet piling	8,820 FBM

Bowers Construction Co. employed an average force of 50 to 60 men on the project under the direction of F. W. Dickerson, General Superintendent. T. M. Blackmon is Foreman at the pile-casting yard.

For the North Carolina State Highway and Public Works Commission, R. R. Roper is Resident Engineer on the Chowan River bridge reconstruction. The Commission is headed by W. H. Rogers, Jr., State Highway Engineer. T. B. Gunter, Jr., is State Bridge Engineer.

Manual on Truck Line

A 761-page shop manual covering all Reo-built trucks from 1940 to the present is offered by Reo Motors, Inc., Lansing 20, Mich. It is divided into 16 sections dealing with individual truck components. It contains illustrations and mechanical data. Provision has been made to keep the book up-to-date by the insertion of new sections.

This literature may be obtained from the company, or by using the Request Card that is bound in at page 16. Circle No. 159.

A. O. Smith Executives

Three personnel changes in the Welding Products Division of A. O. Smith Corp., Milwaukee, Wis., manufacturer of welding electrodes and welding machines, are announced by the company.

J. W. Spoor is named General Sales Manager; L. F. Vonier, former Sales Manager, fills the newly created post of Sales Promotion Manager; and Charles Smith succeeds Mr. Spoor as Product Service Division Manager. Mr. Spoor and Mr. Vonier will both make their headquarters at Milwaukee.

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IDAHO—Intermountain Equipment Co., Broadway at Myrtle St., Boise; 210 N. Fourth, Pocatello.
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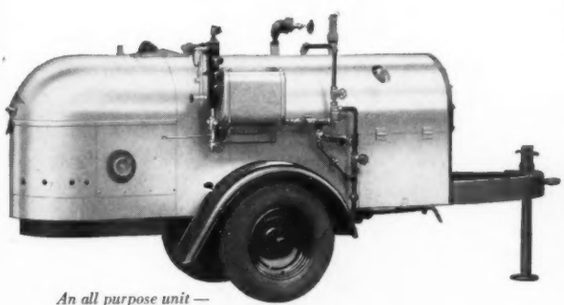

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Round or irregular-shaped objects can be tightly held in the Sevo vise. The jaws swivel in any direction.

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Anyone who has had to lock a round or tapered object in a vise knows the trouble of getting a tight hold without damaging the work. A Swedish-made universal screw vise that clamps round, tapered, or irregular objects is distributed by De Wilde-Jones, Inc., 181 Steuart St., San Francisco 5, Calif.

The jaws of the Sevo vise consist of a series of machined and ground flat plates which hinge or swivel in any desired direction to coordinate with the shape of the object held. These jaws are so designed that they can be moved in relation to each other, and the work piece can rest on a contact surface underneath. When the main screw is turned the locking jaws position themselves and can then be locked to retain their position.

The vise jaws are made of precision-ground Swedish steel. The distance between them, in the two sizes of vise available, is 2½ and 5 inches. A slight turn on the tightening screw causes the vise to grip the object tightly without imposing a heavy torque, the company says.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 201.

Entraining Solution

A new solution which entrains air in concrete is announced by the Davies-Young Soap Co., Dayton, Ohio. Buckeye solution contains 12½ per cent Vinsol resin. Concrete mixed with it is said to flow into forms freely and require less spading, rodding, and vibration; water does not rise to the top; aggregates do not tend to settle; bleeding and segregation are reduced; and the scaling caused by de-icing salts, and cracking and weathering caused by intermittent freezing and thawing, are also said to be reduced.

Where interground air-entraining cement is used in an average concrete (5 to 5½ sacks per yard) the company recommends the use of approximately ½ ounce of the solution per bag of cement to produce the entrainment of 3 to 6 per cent of air; where gray cement is used, it suggests that 2 to 2½ ounces of the solution be used per bag of cement.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 119.

Catalog on Electric Plants

Detailed information on a complete line of electric plants for stationary, portable, and standby service is available from D. W. Onan & Sons, Inc., 4855 University Ave., Minneapolis 5, Minn. The various models described range in capacities up to 35 kw.

The catalog describes each briefly, illustrates it, and lists specifications and accessories. It tells how to choose the type and size of plant for your needs.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 212.

Truck Maintenance Standards

The continued parts shortage due to defense needs has had the effect of making truck owners more maintenance-conscious, says J. N. Bauman, Vice President of The White Motor Co. Mr. Bauman's statement was contained in his monthly Emergency Service Corps report to owners of White trucks and busses on the availability of replacement parts.

The White Motor Co. has completed a nation-wide survey of owners of its trucks and busses, and has compiled much valuable information about customer use of the vehicles. It has registered nearly every one of its vehicles now in service, together with its mileage, type of service, and parts number. This information is kept in tabulated form ready for reference when any one of the trucks or busses is in need of repair or replacements. Such an inventory by location eliminates a great deal of transfer and reshipping, as parts are on hand in localities where they are most needed.

In order to further the interest of White-vehicle owners in the maintenance of their trucks and busses, the company is cooperating with owners in a 10-point program designed to make it as easy as possible for any White vehicle to receive a complete repair service with minimum delay.

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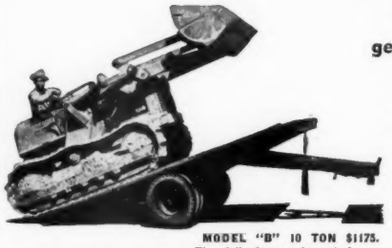

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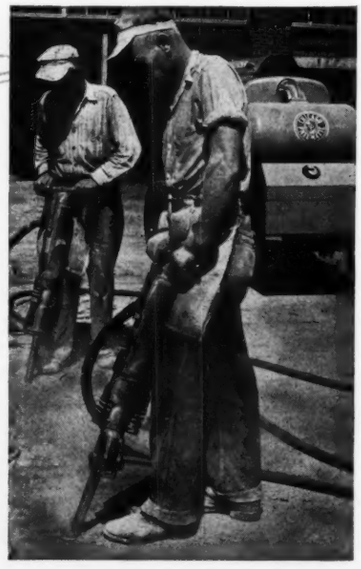

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F. N. Barker, Chief Highway Engineer of Illinois, speaks his mind on safety at the Fifth Annual Virginia Highway Conference at Lexington, Va.

Virginia Conference Stresses Road Safety

A "three-E program" of safety—Engineering, Enforcement, and Education—is essential to the reduction of the nation's highway accident toll. One E alone, Engineering, won't do it, because engineering, however good, cannot design a foolproof highway. This was the conclusion reached at the Fifth Annual Virginia Highway Conference in Lexington, Va., from October 15 to 17.

A record turnout of 750, including city and county officials, law-enforcement officers, parent-teacher representatives, and engineers, heard talks at Jackson Memorial Hall of the Virginia Military Institute during the 3-day conference.

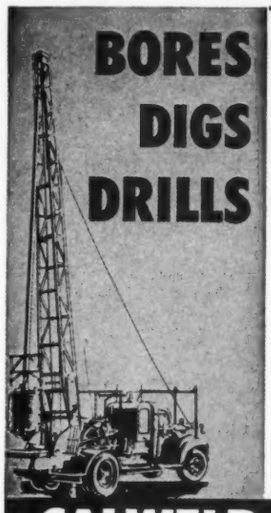
Taking part in a safety panel on the three E's, F. N. Barker, Chief Highway Engineer of Illinois, pointed out that motorists can kill themselves on the most modern of highways. "Good engineering can help only to a small degree", said Mr. Barker, though "modern highway design, of course, counts in our efforts to check death on the highways." Human failures account for many accidents, Mr. Barker said, and in this connection he expressed the opinion that some of the multilane superhighways induce faster driving and an inevitable increase in accidents.

Judge James P. Economos, Director of the Conference of Traffic Court Judges and Prosecutors, of the American Bar Association, Chicago, said that judges must take traffic cases as an opportunity to educate defendants. He urged that all traffic-law violators be required to appear in court and that all judges increase their individual attention to such cases, so that adequate corrective penalties may be assessed.

Dr. Herbert J. Stack, Director of the New York University Center for Safety Education, was the advocate for the third E—Education—and stressed the proper training of drivers, beginning with elementary-school emphasis on safety. He also urged the strengthening of campaigns by bus and truck companies to train their drivers. He said highway engineers could help with good markings and warning signs properly placed.

Other well known speakers at the conference, which was sponsored jointly by the Virginia Department of Highways and the Civil Engineering Department of the Virginia Military Institute, were Mrs. Fred W. Knight, National Safety Chairman of the National Congress of Parents and Teachers; W. Robie Dunman, Assistant Director of the President's Highway Safety Conference; Judge M. Ward Forman, President of the National Association of County Officials; Maxwell Halsey, Executive Secretary of the Michigan State Safety Commission; Judge George D. Neilson, a Washington municipal-court judge; Charles M. Noble, Chief Engineer of the New Jersey Turnpike Authority; Fred Burggraf, Acting Director of the Highway Research Board; and D. L. Chaney, Regional Structural Engineer of the Portland Cement Association.

U. S. Senator A. Willis Robertson made the principal address at a "family dinner" in Crozet Hall, at which Governor John S. Battle served as toastmaster. Senator Robertson's words summed up the safety-consciousness of this year's Conference: "We must teach that safety on the highways is like democracy—a matter of cooperation and coordination; that liberty to operate an automobile over a modern highway must be protected in the same way that all other liberties must be protected: with a view to similar enjoyment on the part of the other fellow."



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BELLED FOOTINGS
WATER WELLS, CESS POOLS

FOR MINERAL EXPLORATION
FOR SOIL TESTING

BORE 10 TO 84-INCH HOLES AS DEEP AS 200 FEET with a Calweld Earth Drill. Interchangeable bucket-type drills speed up the boring of any type of soil, quickly removing earth with each pass. Each operation is mechanically performed. All controls are centered in a single unit for convenient one-man operation. Built on a skid frame for mounting on trucks. Write for bulletin.

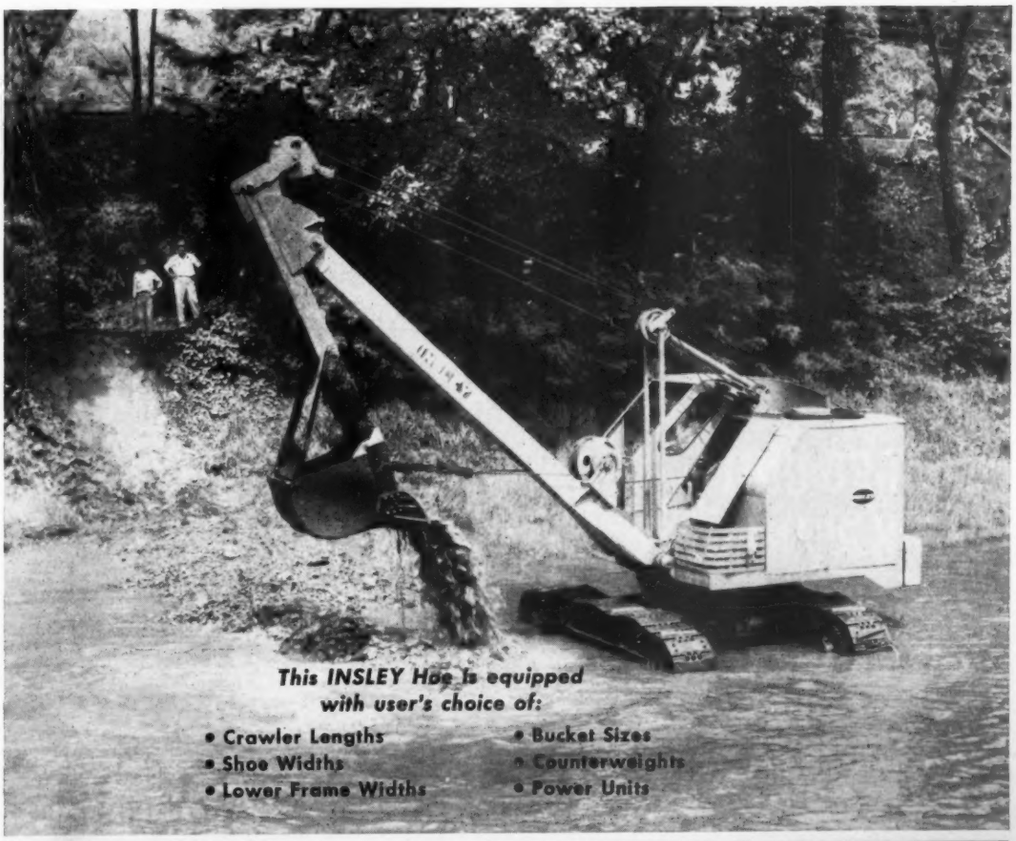
California Welding & Blacksmith Shop, Inc.
7222 E. Slauson Ave., Los Angeles 22, California
EXPORT OFFICE: 50 Church St., New York 7, N.Y.

CALWELD EARTH DRILLS

THERE'S AN INSLEY WORKING NEAR YOU

Project Rated—

by the user . . . to do his job best



This INSLEY Hoe is equipped with user's choice of:

- Crawler Lengths
- Shoe Widths
- Lower Frame Widths
- Bucket Sizes
- Counterweights
- Power Units

INSLEY MANUFACTURING CORPORATION
INDIANAPOLIS 6, INDIANA

Crankcase Repair

A method of repairing crankcases—instead of junking them once bearing bores are scored—has been developed by The Autocar Co., Ardmore, Pa. It consists of resurfacing the scored cast iron of the bore with nickel-alloy weld metal and then machining down to the original dimension.

The procedure, now used by service departments of Autocar factory branches across the country, is designed to save truck operators thousands of dollars. The company reports almost 100 per cent salvage success so far. It uses International Nickel Co.'s Ni-Rod or Ni-Rod 55 electrodes for the work.

Further information may be secured from The Autocar Co. Or use the Request Card at page 16. Circle No. 154.

How a Welding Torch Works

"You don't need an egg beater to mix gases" is the interesting title of a booklet prepared by National Welding Equipment Co., 218 Fremont St., San Francisco 5, Calif. It explains cleverly and clearly how welding torches work, discussing the molecular mixing of gases, the temperatures of welding and cutting flames, and the principles of torch mixers.

The booklet highlights the development by National of the Multi-Mixer, an efficient, safe mixing chamber of ample gas capacity for the smallest or largest welding tip. The company reports that the mixer will create any flame type which an operator requires for his work.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 135.

McNamara Construction Co., Ltd., used a Littleford Model 4000 G Kwik-Steam vapor generator on a pile-driving job at Hamilton, Ontario, for the Steel Co. of Canada

Quick Pile Driving

A Model 4000 G Kwik-Steam vapor generator demonstrated its speed recently on a pile-driving job in Hamilton, Ontario, Canada. The contractor, McNamara Construction Co., Ltd., connected the double-duty Kwik-Steam to two Vulcan hammers at the same time, one a single-acting Model No. 1 and the other a double-acting 50 C. Production of more than 4,000 pounds of steam per hour made it possible for the two hammers to operate simultaneously, while effecting a reduction of about 50 per cent in fuel cost. The cold water to be sent through the generator was first chemically treated to prevent clogging and corrosion of coils, then pumped into the generator and continuously turned to steam as it proceeded through the machine's 500 feet of seamless steel coil. On this pile-driving job, where a heavy intermittent load was needed, two steam chests were used to store the steam.

The Kwik-Steam used on the Canadian project is a 165-hp model with operating pressures that can be regulated between 75 and 300 psi. It builds up full working pressure 2 minutes after a cold start. Safety in operation is achieved by automatic controls, and a predetermined steam pressure is maintained at all times.

Further information on the Kwik-Steam may be obtained from Littleford Bros., Inc., 465 E. Pearl St., Cincinnati 2, Ohio. Or use the Request Card at page 16. Circle No. 171.

Concrete-Testing Machine

A circular on the Baldwin 100,000-pound-capacity concrete-testing machine is available from Baldwin-Lima-Hamilton Corp., Philadelphia 42, Pa. This unit consists of two individual parts: a loading unit and control unit. Both are designed for support by any substantial floor, rather than by special foundations. The bulletin discusses features of the machine—hydraulic loading and independent hydraulic load weighing—its accessories, and specifications.

This literature may be obtained from the company by requesting Bulletin No. 327, or by using the Request Card at page 16. Circle No. 146.

To solve any storage problem

Put the pieces together

GAR-BRO UNIT BATCH PLANTS

ASSEMBLE THE UNITS in any combination to meet your batching or storage requirements. They're engineered to handle aggregate and/or bulk cement and are easily re-arranged for use on the next job. Double-rail tracks on each unit lock together and carry the traveling weigh hopper equipped with multiple-beam scale. Weigh hopper is adjustable to discharge from either side or either end. Write for bulletin.

GAR-BRO MANUFACTURING CO., 2416 East 16th Street, Los Angeles 21

ASSEMBLE IN ANY COMBINATION

"We Specified VIBER Vibrators Exclusively on this Big Job"

20 YEARS
EXPERIENCE MAKING ONLY CONCRETE VIBRATORS

Viber Company has spent over twenty years in research, development and field tests on concrete vibrators. This concentration has produced dependable vibration equipment

ACCEPTED by ENGINEERS and CONTRACTORS the WORLD OVER

Literature will be furnished immediately upon request.

VIBER COMPANY
Concrete Vibrators Since 1931

726 South Flower Street
Dept. 25 Burbank, California

Shop-Built Machines Trim and Line Canal

Tricky Canal With Varying Bottom Widths Lined One Side At a Time by Unusual Shop-Built Equipment

• UNORTHODOX shop-built equipment did the trimming and lining on a $1,282,000 canal - construction project which J. A. Terteling & Sons recently finished for the U. S. Bureau of Reclamation. The 1.3-mile job was a part of the Main Canal which delivers Columbia River water from the Grand Coulee Pumping Plant to thirsty acres of farmland down through the Columbia Basin.

The special equipment, which permitted one side or the bottom of the canal to be lined at a time, was needed primarily because of many transitions. Bottom widths of 20, 46, and 120 feet were encountered, with necessary transitions between. The contractor would have had to alter conventional equipment many times, even if the use of such equipment had been possible at all.

Through Rocky Ground

Terteling's job lay only about 2 miles below Bacon Tunnel, a well known part of the Columbia Basin distribution system. The terrain is rocky and rugged many miles south of the tunnel, and Terteling's work passed frequently through basalt formations.

After drill crews had finished working with wagon drills and in some cases with coyote holes, the main canal excavation prism was removed by a Bucyrus-Monighan 5-W walking dragline. The final slopes were so rocky that an earth cushion had to be placed, so that trimming could be done to close limits. A silt-sand formation was located in a borrow area close by, and this material was hauled in. It was applied to the canal banks by casting with a dragline. Approximately 12 inches of the material went on.

The dragline then moved down into the bottom of the canal and picked up a heavy Hyster grid roller on its load line. Rolling was accomplished by setting the roller at the top of slope and letting it roll to the bottom by its own weight. The compacted cushion material was placed about 4 to 6 inches full, so the canal trimmer could have an adequate bank to work against.

Special Trimmer

The special trimmer consisted of a heavy frame, rail-mounted both at the top and bottom of the canal, to carry the trimming equipment. The frame was fabricated in two open rectangular trusses, with a center bucket-line section.

A Le Roi diesel-electric set furnished power for the motors which drove the wheels of the machine. The main bucket line, mounted in the center of the rig, was driven from the top by a Ford V-8 engine. A small 30-inch cross conveyor, driven by an electric motor, was mounted under the bucket line at the breakover point, so that dirt brought up to the top of the canal would spill out to the cross conveyor as the bucket line passed the top pulley.

A 30-inch stacker conveyor, also driven by an electric motor, then took the excess dirt up at an angle of about 45 degrees and dumped it to a spoil bank at the side.

Working against a 1½ to 1 slope, 30 feet long, this trimmer made as much as 658 feet in an 8-hour shift. Progress was often slower, however, owing to

(Continued on next page)

C. & E. M. Photo

It took some unorthodox equipment such as the curing and lining machines in the foreground, to complete a canal job near Coulee City, Wash. A Northwest 80-D crane and a Rex 34-E dual-drum paver operate in the background.

For the Finest in Chain Saw Performance — Lombard Model 7 Two Man Saws with new Warren High Speed Chain

12% more power
10 lbs. lighter weight

Dept. 7
LOMBARD GOVERNOR CORP.
ASHLAND, MASSACHUSETTS

SOUTHWEST
Compaction Roller

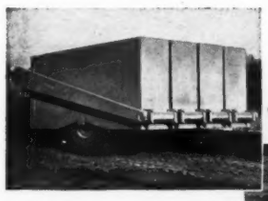
Note how every print of each tire tread is uniform in depth and shape.

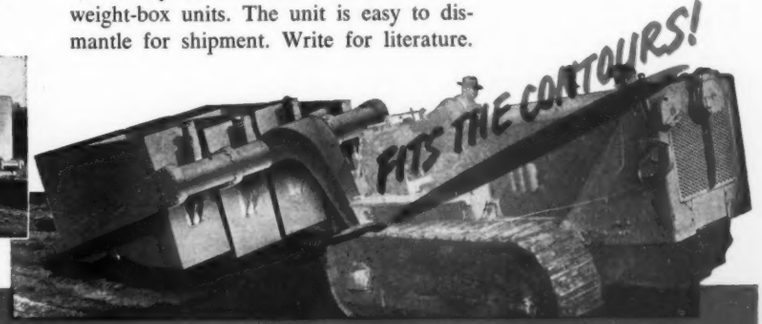
The weight-box units are hinged at the rear and oscillate independently.

For compacting earth fills!

UNEVEN GROUND CONTOURS cannot reduce the efficiency of the new Southwest Compaction Roller. As it travels over the variable surface of the earth fill each weight-box unit with its own wheel and tire oscillates independently up and down. Compaction is positively uniform because the weight on each tire remains constant—there is no bridging and no sudden shifting of load from tire to tire.

The sectionalized tubular yoke permits the use of any combination from three to six weight-box units. The unit is easy to dismantle for shipment. Write for literature.



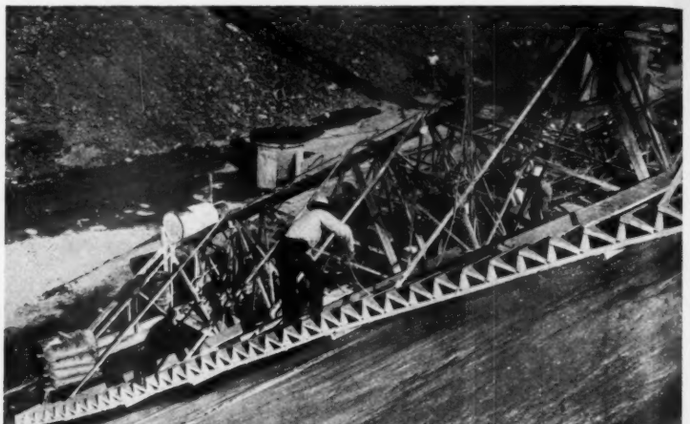


CONSTRUCTION MACHINERY DIVISION
Southwest Welding & Manufacturing Co.
Alhambra, California

HAULING SCOOPS BULLDOZERS LOADERS BOTTOM DUMP WAGONS RIPPERS TAMPERS SCRAPERS TREE DOZERS

C. & E. M. Photo

The trimmer on the J. A. Terteling & Sons canal job was specially built to deal with varying canal-bottom widths. It consisted of a heavy frame, rail-mounted top and bottom, to carry the trimming equipment.

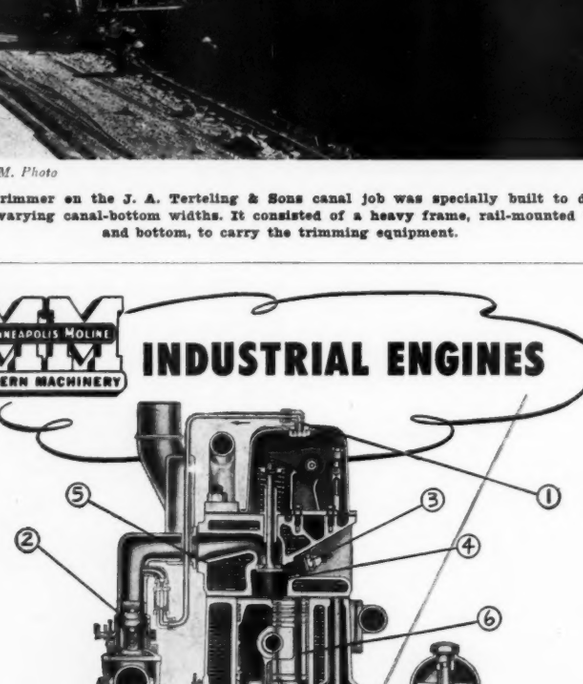


C. & E. M. Photo

Concrete is cured on Main Canal. A workman sprays Hunt Process White solution from the finishing and curing rig.

MM MINNEAPOLIS MOLINE MODERN MACHINERY

INDUSTRIAL ENGINES



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Advanced Engineering with *Quality Controlled* production makes Minneapolis-Moline Power Units the superior, heavy-duty power choice. Tested and proved on heavy power application, MM Engines' extra size and weight are an assurance of added years of reliable performance. Moderate engine speeds furnish steady, continuous power which takes advantage of the engine's high torque and helps make MM the best value for low fuel consumption.

Make your next power installation an MM Engine. See your MM Dealer or write MM for the complete story on MM Engines. 25 to 230 h. p. *MM Engines are designed to save you money,* NOW AND LATER!

1. **CRANKCASE**—Vacuum ventilation with metering valve.
2. **CARBURETOR**—Any fuel: gasoline, distillate, natural gas, LP gas.
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10. **BEARINGS**—Precision, steel shell, babbitt lined.
11. **CRANKCASE**—Rigid design with ample bearing support.
12. **OIL PUMP**—Submerged, gear-driven, located in sump.
13. **OIL SCREEN**—Extra large.

See your MM Dealer-Distributor or write

MINNEAPOLIS-MOLINE
MINNEAPOLIS 1, MINNESOTA

Shop-Built Machines Trim and Line Canal

(*Continued from preceding page*)

the necessity of keeping slopes constantly sprinkled. It was important to keep the operation fairly well closed up.

The only trimming difficulty with this machine which ever became a problem was an occasional rock in the earth cushion. When small boulders in this material were encountered, one of the men aboard the rig scrambled down and dug it out by hand. An operator and only 2 other men ran this machine.

Special Liner

The slip-form lining machine was built like the trimmer, in that it was wheel-mounted both at the top and bottom of the canal. About 20 feet long, the machine consisted of two rectangular trusses with a movable slip-form screed which could be hoisted from the bottom toward the top of the lining.

An International diesel-driven generating set furnished power for the lining machine, for vibrators, and for a conveyor belt on the mixer.

Concrete lining tapered from 6 inches at the canal bottom to 5 inches at the top. It was placed in a well organized sequence. A fleet of batch trucks, owned by Harry Griffin, hauled three dry batches each from a Noble semiautomatic batch plant erected about halfway through the job. The batches were dumped one at a time into the closed-in skip of a Rex 34-E dual-drum paver. Mixing water was pumped through a pipeline, from a spring 2 miles away. A 2,500-gallon tank hauled from a standpipe for road-sprinkling purposes.

When each batch was mixed, the paver discharged the concrete not into the usual paver bucket, but into a 30-

(*Concluded on next page*)

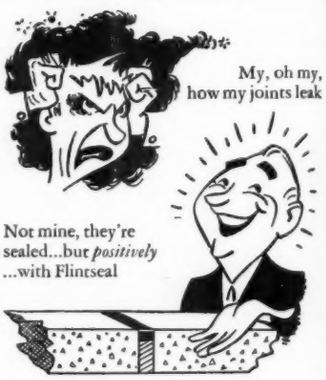
CB JAM PLUGS

afford quick, easy, tight grout hole connections for inlet holes drilled in rock, concrete, masonry, etc. A few turns of expander screw tightly cushions sleeve against the hole permitting full flow of grout, and firm seal around the grout hole. Reverse turn of handle releases plug. 1¼" pipe size (2¼" hole) $17.50 each. Extra sleeves available.

Other sizes on request

C. L. BALLARD 420 Lexington Ave., New York 17, N. Y.

Stop worrying about joints...



...specify *Flintseal** Hot-poured joint-sealing Compound

(Fed. Spec. SS-F-336a)

Troubles you may have had with sealers that flow or extrude, crack or pull away, simply do not exist when the joints are sealed with Flintseal.

One application lasts for years... gives positive sealing against water and foreign matter. Flintseal holds its bond *firmly* through extremes of hot and cold weather.

Flintseal is a rubber asphalt thermoplastic compound of the hot-poured type that remains extensible and compressible through complete cycles of expansion and contraction of the concrete.

Thousands of miles of concrete highways, streets and airport strips need *positive* sealing of joints to protect the millions of dollars invested. Flintseal has been field-proved for this purpose.

Send for free, illustrated, descriptive booklet

Complete technical data and specification procedures are also available upon request.

THE FLINTKOTE COMPANY
Industrial Products Division
30 Rockefeller Plaza, N.Y. 20, N.Y.

The Flintkote Company of Canada, Ltd., 30th Street, Long Branch, Toronto, Canada

FLINTKOTE
Products for Industry

*Reg. U. S. Pat. Off.

inch chute hung from the paver boom. This chute, about 35 feet long, carried the concrete out to a downspout and dumped direct into a 1½-yard Gar-Bro transfer bucket hanging from the boom of a Northwest 80-D crane.

The crane dumped the material inside the slip form, beginning at a point near the canal toe. As the space ahead of the screed was filled, the screed was hoisted up the slope, with a fixed Syntron vibrator working on the slip form. When the slip form reached the top of slope, another 20-foot section was finished and the machine was ready to move ahead.

Up-and-down contraction joints were cut in the lining by a steel knife fixed to the slip form. It could be moved over to any desired position. Longitudinal joints were cut by steel bars mounted on a trailing rig, which was used for finishing and curing. Hunt Process White solution was the curing agent, and the concrete finish was steel-troweled.

Footages of 400 linear feet a day were quite common, but despite the best attempts, the job ran slightly into an overtime period. Work was completed before the September target date when water was expected to flow for the first time through the canal.

Field operations for the Terteling organization were under the supervision of E. C. Williams, Project Manager.

Chemical Treatment Protects Metal Parts

A chemical treatment for protecting iron and steel moving parts has been developed by Octagon Process, Inc., 15 Bank St., Staten Island 1, N. Y. Rustshield 2 is a phosphatizing compound which is designed to change steel and iron surfaces to rustproof, absorbent, nonmetallic areas which will retain lubricating oils. Metal parts so treated will remain properly lubricated longer than smooth steel surfaces, Octagon says. The compound also helps to prevent scuffing and galling.

Rustshield 2 can be applied to rubbing and sliding surfaces of precision parts such as thrust washers, pump pistons, gears, valve roller pins, stems, and guides, and bearing surfaces of every type. Although the treatment increases the surface area of the parts by creating tiny hills and valleys, these are so minute and numerous that tolerances are not affected, the producer says. A final coat of drying oil or wax increases the corrosion resistance which the treatment lends.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 207.

Circular on Safety Goggles

A circular describing the Saf-I-Duo, a safety goggle with interchangeable lenses, is available from United States Safety Service Co., 1215 McGee St., Kansas City 6, Mo. It illustrates the two models available, with their four types of ventilation, and gives prices for quantity orders. It points out that the goggles resist impact, dust, fumes, and chemicals. The lenses are replaceable and can be varied in color to meet special purposes. The Saf-I-Duo can be worn over prescription glasses.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 108.

A Truck-Mixer Unit

A new truck mixer has been announced by The Transmission & Gear Co., 10421 Haggerty Ave., Dearborn, Mich. It is available in 3½ and 4½-cubic-yard sizes. The Transomixer features a permanently leakproof seal between hopper and mixing drum, which is designed to save the maintenance and replacement formerly required on this part.

The new unit is equipped with a Transo direct drive which eliminates sprockets, drive chains, and ring gears, and saves from 800 to 1,600 pounds of dead weight, according to the company. It has a planetary-type transmission to prevent shock loading and to give smooth charging and discharging. All clutches run in oil and are spring-loaded for self-adjustment. The unit has two starting and discharge speeds, and the built-in water pump has a separate spring-loaded clutch.

The Transomixer features a permanently leakproof seal between hopper and mixing drum. Its direct drive saves from 800 to 1,600 pounds of dead weight.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 197.

WORLD'S LEADING TRUCK SHOVEL

THE ONE AND ONLY "QUICK-WAY"

Reg. U. S. Pat. Off.

QUICK-WAY truck shovels can be found "on the job" in every one of the 48 states and in 65 foreign countries as well.

Yes . . . *QUICK-WAY* . . . the original and always the standard among truck shovels, demonstrates its versatility and adaptability, as well as its superb engineering and long-lasting construction, in Alaska and the Amazon, Great Britain and British Columbia.

Abroad, as well as at home, *QUICK-WAYS* get to and from the job faster. They're on the job more, because they're "between location" less. And *QUICK-WAYS* are quickly converted in minutes from shovel to scoop, dragline, trench-hoe, crane, clamshell, pile driver or backfiller. And most important of all, *QUICK-WAYS* are built for long, hard service with quality materials and superior workmanship. They're truly an investment in profits.

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Please send me complete details on "QUICK-WAY" truck shovels — four different models for large jobs and small.

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Self-Priming
CENTRIFUGAL PUMPS

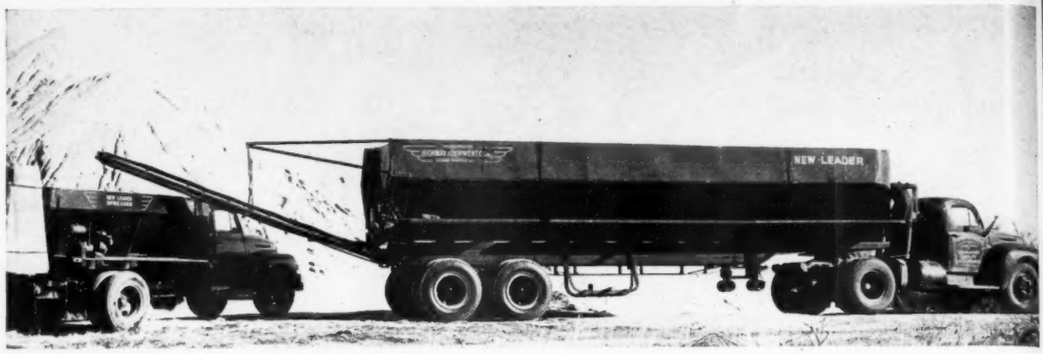
Engine, belt, and electric driven pumps with many new features to give you outstanding performance at low cost. A.G.C. rated. Write for special bulletins.

RICE PUMP & MACHINE COMPANY
220 N. Milwaukee St. Grafton, Wis.

New Self-Unloading 20-Ton Bulk Transport

A 20-ton bulk-materials transport with self-unloading features has been introduced by Highway Equipment Co., Inc., 616 D Avenue N.W., Cedar Rapids, Iowa. It has four separate compartments, each of which has a separate bottom-dump door; the openings are operated by a lever on the outside of the trailer. This makes it possible to carry four different 5-ton loads of material in one trip.

The conveyor chain that runs along the bottom of the New Leader trailer brings the material to a 14-foot elevating conveyor for truck loading. The conveyor and elevator are powered by a 13-hp air-cooled Wisconsin engine operating through a clutch which is able to control starts and stops instantly. The elevator is carried on a catwalk alongside the body when not in use. It is swung into position by a hoist, and is adjustable to unload in any direction and height.



With its four 5-ton compartments and separate bottom-dump doors, the New Leader trailer can carry four different loads in one trip.

The company points out that compartments and rear endgates are removable so that the trailer may be used to transport other materials such as bagged or packaged goods, etc. Similar units with capacities of 5 to 25 tons and lengths from 11 to 40 feet are also available from the company.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 204.

New-Type Foundation

An 8-page catalog outlining the features of a new type of foundation is offered by Franki Foundation Co., 436 Seventh Ave., Pittsburgh 19, Pa. Step-by-step photos illustrate the method of driving and concreting Franki displacement caissons. Tabulated test data for a number of installations are included. Though this particular foundation is somewhat new in the United States, it has been used in 36 other countries. Over 1,400,000 of the caissons have been installed since 1910. Recently completed is a blast furnace foundation near Pittsburgh. A single caisson carried a 200-ton test load with a net settlement of 0.03 inch, the company reports.

Installation usually goes this way: An alloy-steel casing is hung in the guides of a specially constructed rig. Dry concrete is placed in the bottom of the casing to form a driving plug. A solid ram weighing from 2 to 4 tons is lowered into the casing and raised and dropped to compact the plug. After compaction, the driving of the Franki displacement caisson is started. The ram acts upon the concrete plug to drive the casing through the ground. At the desired depth, the steel casing is anchored to the driving frame and the sealed concrete plug is partially expelled. Additional quantities of concrete are added to compress the surrounding soil and form an enlarged concrete bulb. Using this bulb as a base, additional concrete is forced through the caisson as it is withdrawn to form a rough concrete shaft with a large bulb footing area. The footing and the added skin friction obtained by the successive layers of rammed concrete provide a foundation that is capable of supporting more than 300 tons.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 218.

Chicago Clamp Mfr. Expands

Symons Clamp & Mfg. Co., Chicago, Ill., announces a 30,000-square-foot addition to its factory. The new building adjoins the company's present factory at 4249 W. Diversey Ave. and affords extra shop space to meet increasing demands. Symons manufactures fabricated concrete wall forms, column clamps, and safety shores.

Every contractor should have these three money savers!

CLECO RC-50 and RC-60 AIR-OPERATED PAVING BREAKERS

The Reed-Cleco Valve, found only in Cleco Paving Breakers, gives full control of both power and return strokes.

Cleco Paving Breakers hit harder and faster and have less recoil. They produce more work per man hour and cost less to maintain than any other demolition tools in their classes.

Write for Bulletin RC-949

CLECO 183-A AIR-OPERATED SUMP PUMP

340 gpm against a 10′ head.
124 gpm against a 70′ head.

High capacity, light weight, low air consumption make the Cleco 183-A Sump Pump the first choice wherever a high-capacity portable pump is needed.

Write for Bulletin SP-849

CLECO No. 5A AIR-OPERATED BACKFILL TAMPER

- Full power stroke of the piston gives deeper penetration and faster compaction.
- Rugged, heavy-duty construction for long life and low maintenance.
- Light weight and excellent balance for easy handling.

Write for Bulletin 76-B

CLECO AIR TOOLS — PNEUMATIC DALETT EQUIPMENT ACCESSORIES

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CHAMPION DERRICK

Boom only can be supplied for use with old-style Mast and bottom
Single line cap. 300# @ 100 feet per minute
Double line cap. 600# @ 50 feet per minute

The most complete line of contractors' derricks, hoists, and winches. Write for catalog.

The Sasgen line is handled by leading equipment distributors everywhere.

SASGEN DERRICK COMPANY
3131 W. Grand Avenue, Chicago 22, Ill.

Don't Let Winter Hit Your Crawler Tractor

Thorough Inspection, Cleaning, and Lubrication Will Make It Live Longer And Look Younger

•ONE of the more irritating axioms instilled into us in our youth is that "prevention is better than cure". Irritating, because true. Take crawler tractors, for example, and listen to what Fred J. Shreck, Supervisor of Service in International Harvester Co.'s Industrial Power Division, has to say about how you should winter-condition them—and what can happen if you don't.

Begin Early

Start thinking about winter before cold weather actually sets in, advises Mr. Shreck, and give up any notion that your crawler will get by this winter without special preventive maintenance. Low temperatures are hard on starting, and this strain, together with the use of incorrect grades of oil, may well turn a small defect into a breakdown. Add to this the difficulty of making field repairs in cold weather, and you will see that quite a sizable loss of time (and money) may overtake the owner of a "fair-weather" crawler.

Preliminary Inspection

First of all, check for oil leaks and look for collections of new oily dirt in odd places. If the engine is dirty, look for places where leakages have streaked the dirt. Next, examine very carefully the engine-transmission and final-drive housings, the sprocket gear and track rollers.

General Cleaning

The next step Mr. Shreck stresses is vital: cleaning the tractor and engine. A 2-inch low-pressure steam is best for this, since it does away with the risk of damage to any gaskets or seal points. Wipe off the bad spots with diesel oil or kerosene.

Mr. Shreck gives four reasons for the importance of this cleaning: (1) It aids proper cooling of the engine. (This is vital in cold weather when lighter oils are used. These oils run hotter—and consequently thinner—than heavy oils, so any crankcase dirt pack impedes their proper cooling and lubricating efficiency.) (2) It shows up oil leaks more quickly. (3) It decreases fire hazard. (4) It gives the operator more pride in his tractor.

Lubrication

Thorough examination of the lubrication system is next in Mr. Shreck's winter program. Begin at the crankcase. Drain the old oil from a thoroughly warmed-up engine, preferably after a day's run. Flush the crankcase with regular crankcase-flushing oil—not diesel fuel or kerosene, which may become trapped inside and cause the new oil to foam. Run the engine, with the flushing oil in it, at half throttle for half an hour. Drain the oil filter, wipe the inside with clean rags, and replace the old filter elements with new. Now refill the crankcase with oil recommended by the manufacturer for the temperature at which the tractor is to be operated. Change the oil in the fuel-injection pump, but do not flush.

Next come transmission, final drive, and sprocket drive. These units will be full of oil which has become heavy with use and may have "channeled" around the moving parts, leaving them dry. Also, dirty oil from the outside will have been sucked in and there may be metal wear particles in the lubricant. The important thing, therefore, is *always* to drain off the oil, even when the units are full. Then put in flushing oil and run the unloaded tractor 15 minutes. Drain or refill in accordance with the manufacturer's recommendation. Then, refill the lubricating gun with the proper lubricant and force the old oil out of the track rollers with new.

Follow up with a complete chassis lubrication, and wipe off the excess lubricant, which gathers dirt and is sometimes drawn back by heat.

Electrical System

Using a wire brush and a solution of warm water and baking soda, clean the battery terminals. Dab grease or special paste on the terminals and tighten them. Check the specific gravity of the cells with a hydrometer, bringing up the water level with distilled water. (Continual low water in the battery indicates overcharging and calls for authorized repair.) Checking, testing, and adjusting the voltage regulator, starter, and generator come next, but should be done by a qualified mechanic. (The testing equipment is portable and can generally be brought to the site.) Finally, check the brushes and bushings of the starter and commutator. Replacement of worn-out brushes on the commutator and generator armature is, again, a repair which should be made only by a qualified mechanic.

Combustion

Proper adjustment of the combustion

(Continued on next page)

Aeroil

Auto-Steam VAPOR CLEANER

The fast and efficient way to clean motors, bodies, tractors, shovels . . . and all contractors' equipment and buildings.

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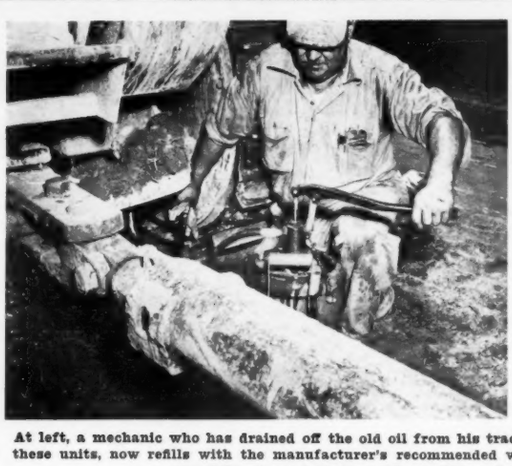
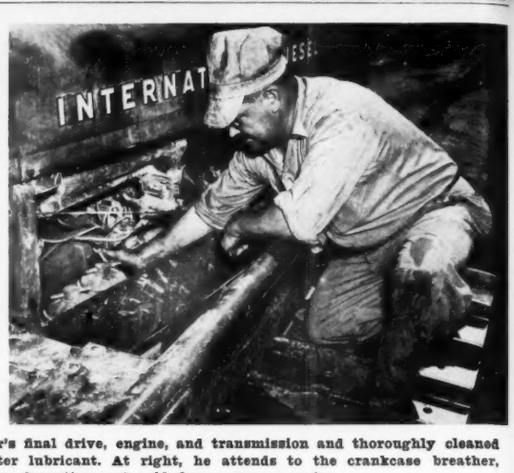
Don't Let Winter Hit Your Crawler Tractor

(Continued from preceding page)

system is essential for fast starts and peak efficiency in wintertime, so clean the plugs first, spacing the gap properly, and check all the connections. Adjust or replace the magneto or distributor points as needed. Clean the magneto impulse coupling with kerosene and lubricate with a light oil such as SAE No. 10.

And don't forget the air cleaner or the diesel-fuel filters and water traps. As regards the air cleaner, remove and disassemble it, then wash it out with diesel fuel or kerosene. Reassemble and fill it with recommended oil, usually the crankcase kind. And check all air-cleaner connections to the inlet manifold to see if there are indications of leaks needing repair. Diesel-fuel filters and water traps—take them apart and wipe out with clean rags; if you forget them, water and debris will combine to reduce engine power as the fuel gradually gets heavier with the cold.





At left, a mechanic who has drained off the old oil from his tractor's final drive, engine, and transmission and thoroughly cleaned these units, now refills with the manufacturer's recommended winter lubricant. At right, he attends to the crankcase breather, especially important in cold weather when condensation and acid fumes are excessive.

Cooling System

Mr. Shreck is still guiding us. Next, he says, check for leaks in the head gasket. The way to do this is to remove the radiator cap and fill level with the cap. Then start the engine and run long enough to open the thermostats. Accelerate suddenly. If bubbles appear, that means the cylinder-head gaskets are leaking. Leaks may also occur in the hose and hose connection and water-pump packing. Check all these, and also the radiator, carefully. Then flush the radiator with flushing compound or a solution of baking soda. Leave the cap off and run until the radiator is hot. Drain and flush with clean water. Finally, drain and refill with the antifreeze called for by the manufacturer. One more check on the cooling system: the fan belt and fan-belt drive pulley. Check them for looseness and adjust if necessary.

A hint on radiator cleaning (outside) comes in very handy here. From a 1-pound coffee can, splash water through the fins with the engine at high idle. The fan will draw the water through the radiator and suck out a lot of invisible debris lodged between the fins. Why a 1-pound coffee can? It holds just the right amount of water. If more is used at a time, there is danger of breaking the fan blades.

Engine-Ventilating System

For proper combustion and lubrication, the complete engine-ventilation system must be cleaned. including the crankcase breather on the side of the engine, breather pipe, and elbows on top of the valve cover. The reason for this is that these pipes take out condensation which may cause corrosion and failure of valve springs and rocker arms. Mr. Shreck recommends further that engine-ventilating systems be checked from time to time during the winter.

A Few Tips on Starting

Starting during cold weather is always a problem, but a few simple precautions will go a long way toward easing it. Tractors working and parked over extended cold periods can be equipped with hood sides. Avoid parking your tractor in an exposed place for a long time without running the engine. If you must keep it out in winter, run it at least once a day. When the mercury is 10 degrees or

(*Concluded on next page*)

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JOY Portable Compressors and "Silver Streak" Air Tools make a highly efficient, time-and-money-saving team—the most modern units you can put on the job. They're light, compact and easy to handle, yet ruggedly built for real heavy-duty service. JOY Portables are available in seven sizes, ranging in capacity from 60 to 630 CFM at standard pressure. JOY Air Tools feature the exclusive "Dual Valve" that makes air do more work, plus cadmium plating for better lubrication, closer tolerances, and prevention of rust and scoring. • Let us show you how JOY equipment can reduce your costs, and produce more work per man-hour. *Write for bulletins, and ask for an actual demonstration.*

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JOY K-81, a rugged tool capable of sustained operation on the heaviest demolition work.

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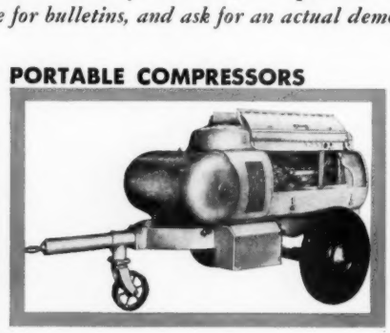

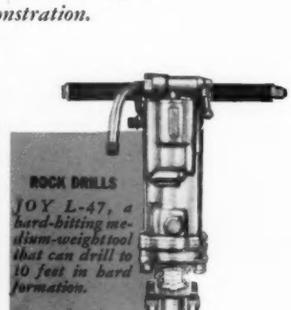

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JOY Q-81, an adaptation of the K-81 for driving wood or light steel sheeting.

BACKFILL TAMPERS
JOY C-35, an easy tool to handle, yet delivers powerful blows for faster tamping.

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JOY M-2, a light tool for digging in clay, shale, hardpan, or hard-frozen ground.

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lower, dilute the oil in the air cleaner and crankcase with kerosene, in accordance with the manufacturer's specifications. Fill the fuel tanks at the end of each workday to prevent collection of moisture.

Storing

Finally, if all this is too much and you decide you'll just put the thing away for the cold weather, Mr. Shreck can help you there too. Following are a few hints about storing your tractor: (1) Choose a dry and protected place to house it. (2) Thoroughly wash and clean it before storing. (3) Completely lubricate the tractor. Drain the diesel-fuel tank, water trap, and fuel filters, opening the air vents to secure complete drainage. Close the vents and work flushing oil through the fuel-injection system as recommended by the manufacturer. (4) Drain all the water from the cooling system. (5) Drain all the gasoline from the gas tank, strainer bowl, and carburetor. (6) Spray inside spark-plug holes and the valve cover, all surfaces above the oil level, also inside the gas and fuel-oil tanks, with a light oil containing a rust inhibitor. The best way to do this is to attach an oil can to an air gun to form a sprayer.

Crawler-tractor owners who follow Mr. Shreck's instructions will be congratulating themselves this winter, as the mercury drops, on having found the time to take these simple precautions.

Labor in Alaska

Alaska's need of contractors for the 1952-53 Corps of Engineers construction program (see C. & E. M., November, pg. 93) has raised many questions about labor conditions in the Territory. Colonel L. E. Seeman, Alaska District Engineer, answered stateside contractors' questions in an interview last October.

The relationship between contractor and labor in Alaska, said Colonel Seeman, follows the pattern established in the States. All military construction work is highly organized by the American Federation of Labor. Certain crafts have established Alaskan locals with offices at various locations in the Territory, while others are under the jurisdiction of the Seattle locals. The Seattle Union of Operating Engineers has branch offices in Anchorage and Fairbanks; ironworkers and sheet-metal unions have offices in Anchorage; and other Seattle locals, such as bricklayers and boilermakers, usually appoint on-the-job stewards for local administration purposes. Unions with local autonomy include carpenters, painters, laborers, cement finishers, roofers, electricians, plumbers, steamfitters, asbestos workers, teamsters, and chauffeurs.

General contractors are now represented in Alaska by an Associated General Contractors' Chapter in Anchorage, and electrical contractors are represented by the National Electrical Contractors' Association.

Negotiations for revision of wage rates and working conditions for 1952 had not begun at the time of Colonel Seeman's statement, but he emphasized that they would be based on the regulations of National Wage Stabilization policies subject to the approval of the National Construction Industry Stabilization Committee. Some basic hourly rates then in operation were quoted by Colonel Seeman as follows: carpenters, $3.14; electricians, $3.50; plumbers, $3.50; painters, $3.15; shovel operators, $3.57; laborers, $2.735; roofers, $3.25; renting of bulldozers, $3.22; 5-cubic-yard truck dumps, $2.87; and flatbed trucks, $2.87.

Contractors interested in the Alaskan construction plans for the 1952-53 season (which are extremely broad in scope) will find all details in the Prospectus of Construction published last October. For copies of this prospectus write to Gil Pearson, Technical Information Officer, Office of the District Engineer, Alaska District, Anchorage, Alaska.

Transits and Levels

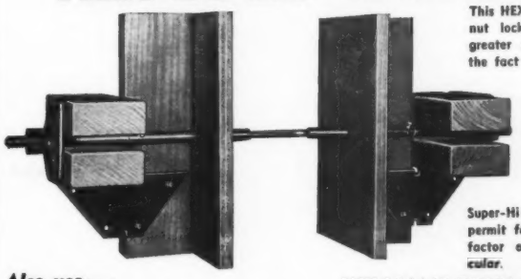
The tenth edition of a complete and detailed catalog featuring transits, levels, and surveying accessories is offered by Warren-Knight Co., 136 N. 12th St., Philadelphia 7, Pa. The 56-page booklet highlights the design and construction of the Warren-Knight line of precision and surveying transits, levels, alidades, and transit-levels. Illustrations and complete specifications are given for each model. The accessories include tripods, level rods, hand levels, plumb bobs, tapes, and engineering field books.

The surveying instruments are suitable for a wide variety of work—everything from precise triangulation to setting lines for pioneer roads. A number of them are specifically designed for use by contractors. The catalog also includes a complete stock of drafting-room supplies. A general information booklet and a price list are available with it.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 168.

New FORM TIE development

HEX-LOCK—SINGLE-UNIT



This HEXLOCK Clamp has a floating nut locked in place. This permits greater ease of operation, due to the fact that you are turning metal on metal instead of metal on wood. This Clamp can also be used directly with our Vibro-Lock Clamp in cases where walls may have a steep batter on one side only. All our clamps employ Super-Hi Tensile Inner Rods, which permit faster pouring with a known factor of safety. *Write for Circular.*

Also use—
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FROM RAW MATERIALS TO POURED CONCRETE

This ruggedly built trio means more jobs covered...reduced labor costs...savings in time and expense of making stationary installations. All functions are performed by one operator on each unit. Completely portable equipment travels at normal highway speeds...setup time for complete operation is 15 minutes or less.

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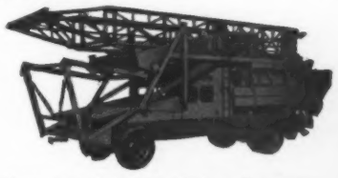
Completely portable unit weigh batches aggregate on the job. Can be charged with front end loader from storage piles or directly from dump trucks. Single operator sets up unit for operation in 15 minutes. Weigh batches up to 50 cu. yds. per hour.

- Three 7 cu. yd. bins and 2 cu. yd. skip store up to 23 cu. yds. of aggregate.
- Charging skip hydraulically operated.
- Bin selector located by skip control directs skip.
- Equipped with either dial or beam scales.
- Weight, 17,800 lbs; height, 12 ft.; width, 8 ft.; overall length, 28 ft. (with skip down).
- Mounted all around on 8.25x20 tires.

2-YD. MIXERMOBILE · Model M-7

Completely mobile concrete mixing and elevating plant eliminates cost of hauling and erecting expensive equipment. One man handles the entire operation from mixer to deck.

- Improved batch-timer and counter insures positive mixing time.
- New electronic water meter gives unerring accuracy.
- Sturdy planetary drive hoist clutches give extra power, durability.
- Mixes up to 50 cu. yds. per hour.



SCOOPMOBILE · Model C. The versatile Scoopmobile with exclusive planetary drive has 7 "quick change" attachments. Standard ¾-cu. yd. scoop bucket permits operator to keep Weigh Batcher unit performing to full capacity.

- Loads and transports aggregate.
- Transports, elevates and pours concrete.
- Lifts and places form panels, timbers, etc., up to 4,000 lbs. capacity.

ATTACHMENTS INCLUDE: Scoop buckets in various sizes, swivel and standard type concrete hoppers to ¾ cu. yd. capacities, lift forks, crane boom, track extensions with braces up to 26 feet overall.

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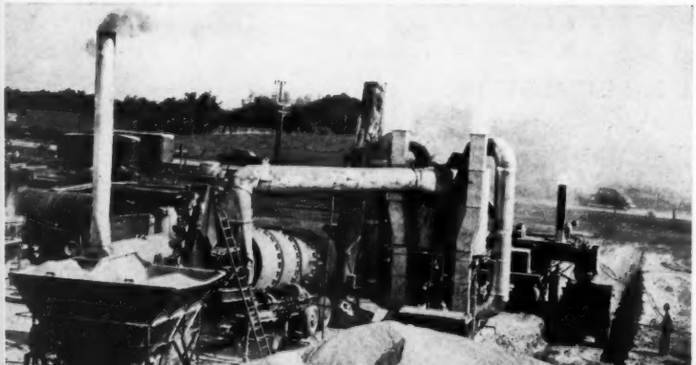
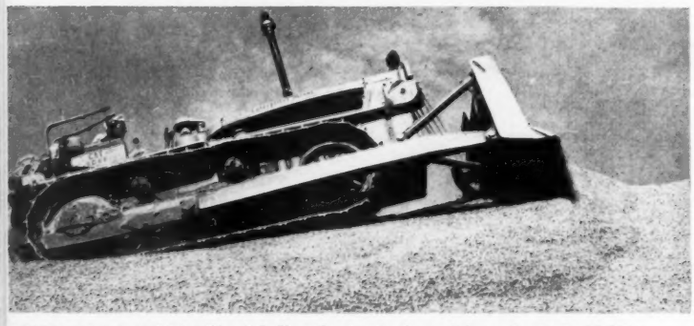
here did the crushed rock come from? This Pioneer setup at Robbins, Mo., owned by W. J. Menefee Construction Co. of Sedalia.



id how about the asphaltic concrete? From this 100-ton Barber-Greene hot-mix plant. Some 97 tons an hour came out of the continuous-mix hopper.



e never cover a project without finding the trusty dozer doing a host of odd jobs. This D7 is stacking the 4-bin-pull aggregate piles at the asphalt plant.

C. & E. M. Photos

1. To dig a widening trench, Midwest mounted a special steel plow on the moldboard of a Caterpillar motor grader. It scooped the dirt to the edge of the old slab.

State Widens Its Old Concrete Road System

By RAYMOND P. DAY

5. Two Apsco rollers compacted the freshly dumped crushed rock.

The dirt dug out had to be hauled away. So the first step was to kick it to one side with this No. 12 motor grader, so it wouldn't fall back in the trench.

3. Now to get rid of the windrow of excess dirt. An Athey Force-Feed Loader moved rapidly along and scooped it up into dump trucks.

• NARROW, obsolete highways, the kind that haunt a construction engineer, are on the wane in the state of Missouri. Slowly but surely the Missouri State Highway Department is widening the bad sections of its 25-year-old concrete-pavement system. During 1951, contractors made a sizable dent in the mileage of deteriorating roads which still remain.

To get a running picture account of how these old highways are made to serve traffic again, CONTRACTORS AND ENGINEERS MONTHLY took a camera to Odessa, where Midwest PreCote Co. of Kansas City was widening 9.724 miles of U. S. 40 3.75 feet on each side of the old 18-foot slab. After the widening with crushed rock and asphaltic concrete, Midwest restored the riding surface by adding a 1.75-inch base course of asphaltic concrete and a 1.25-inch wearing course. The asphaltic concrete was made of 70 to 85-penetration asphaltic cement, two coarse sizes of crushed limestone, and two fine sizes of rock and sand. The job is exceptionally well organized.

4. With the trench rolled, an Apsco spreader put in the first course of widening material—3 inches of crushed limestone.

6. An Apsco spreader then laid the asphaltic concrete in three 3-inch courses.

7. A Buffalo-Springfield roller compacted the asphaltic concrete.

The Big Chief steel tape rule features a swinging tip that rotates to one side to permit inside, butt-end, and depth measurements.

New Steel Tape Rule

A new steel tape rule is announced by Carlson & Sullivan, Inc., Monrovia, Calif. The Big Chief features a ¾-inch-wide white face blade 10 feet long. The graduations are marked in black on a white surface bonded to the steel, which is said to make them rust and acid-resistant. The extra-wide blade makes possible vertical use of the rule to its full length without buckling, the manufacturer points out.

The bottom edge of the rule gives inches (1 to 120) and the top edge is calibrated in feet. This permits conversion of inches to feet at a glance, the company says. The rule also features a patented blade change, which is said to permit replacement of accidentally damaged blades at about one-half the cost of a new rule. The tip rotates to one side to permit accurate inside, butt-end, and depth measurements. The Big Chief weighs approximately 6 ounces and fits into a pocket.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 128.

Coffing Hoist Elects

Coffing Hoist Co., Danville, Ill., manufacturer of electric, portable, and hand hoists, announces the election of J. R. Coffing as Vice President in Charge of Sales, Advertising, and General Office Administration.

Mr. Coffing has been with the firm for 22 years.

A Wheeler template 24 feet long places four tapered steel road-joint strips 2 inches deep. A handle on each end of the template releases the strip.

Road-Joint Template

A template for placing steel joint strips in highways, streets, runways, etc., is announced by Wheeler Paving Accessories Co., 930 S. Josephine St., Denver 9, Colo. It comes in various lengths and can handle up to 4-inch-wide strips, either straight or tapered. The guide clips are adjustable to hold strips up to ¾ inch thick. Placing takes less than a minute, the company says.

A handle on each end of the template controls the hooks holding the strips in the guide clips underneath the template. After the strip is placed and the template is lifted, a metal clip is placed over the center strip that binds the two cross strips together, making a cross joint. Later the strips may be pulled out by a pair of pinchers.

Wheeler also furnishes, with or without the templates, formed V-shaped steel strips with interlocking ends.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 173.

Anti-Rust Paint

An anti-rust paint which can be applied over rust without wire-brushing, scraping, or sandblasting is announced by The Monroe Co., Inc., 10703 Quebec Ave., Cleveland 6, Ohio.

Rust-Cure is suitable for both interior and exterior use on either old or new metals; it penetrates any existent rust layer and seals the surface against further rust action, the company says. It is compounded for brush application and may be thinned with solvent for spray use. The black and aluminum Rust-Cure is for use solely as a finish coat, while the clear can be painted over in any desired color. It is available in 1 and 5-gallon cans and in 55-gallon drums.

Further information may be secured from the company by requesting Bulletin 127-11. Or use the Request Card at page 16. Circle No. 121.

Waterproofing Specifications

A set of waterproofing specifications and instructions for use are available from Dasco Co., Inc., 1602 Thames St., Baltimore 31, Md. These spex outline the features of Dashide, a transparent liquid waterproofing for exterior or interior walls. The product is designed to resist acid and alkali, and to withstand temperature changes without peeling, cracking, or slivering. It may be brushed or sprayed on, and is said to penetrate ¼ to 1 inch into the masonry surface.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 216.

Solve Compaction Problems

EFFICIENTLY, QUICKLY, DEPENDABLY

With

HUBER *GENERAL - PURPOSE* 3-Wheel ROLLERS

8-10-12-14 TONS • GASOLINE-DIESEL

Since Huber pioneered the "automotive-type" roller in 1923, it has led the industry in the refinement of these versatile machines. Huber has made 3-wheel rollers truly general purpose machines.

FOR GRADE WORK, the Huber 3-wheel is widely used for compaction of earthworks, embankments, sub-grades, trenches and insulation courses. These rollers usually are equipped with 18" face rolls on the 8-ton units, and 20" face rolls on the 10, 12, 14 ton sizes to gain maximum compaction per lineal inch.

FOR FINISHING, Huber 3-wheel rollers normally are equipped with the wide face rear rolls where high compression per lineal inch is not required and the wider rolling width is desirable. They are in wide use for rolling water bound macadam, surface treatment, sheet asphalt and ahead of tandems on asphaltic concrete and other bituminous mixtures.

For more information about Huber GENERAL PURPOSE 3-wheel rollers, ask for our new 20-page bulletin, No. H-150.

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Send for catalog or see your local distributor.

The Cleveland LSRR air vibrator helps unload bulk cement from a dump truck.

Air Vibrator Helps Unload Bulk Cement

Bulk-cement unloading is another use cited by Cleveland Vibrator Co., 2850 Clinton Ave., Cleveland, Ohio, for its LSRR air vibrator. The accompanying illustration shows the LSRR mounted in a horizontal position on the side of a 20-ton-capacity dump truck, to speed unloading of materials that have a tendency to pack down in transit. The vibrator is equipped with a cast-steel male bracket which fits snugly into the female bracket.

Operating intermittently, the LSRR can unload 40,000 pounds of bulk cement in 30 minutes. With continuous operation, this time could be reduced substantially, the company says. The unit is recommended by Cleveland for use on other types of material-handling equipment including hoppers, bins, and chutes. It can easily be moved from one installation to another.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 200.

For Tax Deductions Under New Tax Laws

A chart which indicates the tax deductions to be made under the new tax laws for every person on a weekly payroll has been prepared by Calcu-Tax, 41 Park Row, New York 38, N Y. It tabulates the *lowest* amount of income-tax withholding based on the new rates which went into effect November 1, and the exact deduction for the Federal Old Age Benefits Tax; on all charts sent to New York State users, it includes the deduction for New York Disability Insurance. For payrolls other than weekly, the company offers the Taxmeter, a compact machine designed for easy use.

Further information on the Calcu-Tax chart may be secured from the company. Or use the Request Card at page 16. Circle No. 109.

Nordberg Personnel Changes

Organizational changes in the Crusher and Process Machinery Divisions of Nordberg Mfg. Co., Milwaukee, Wis., are announced. Howard M. Zoerb, formerly Chief Engineer of the Crusher Division, has been appointed Administrative Manager of the divisions. Ad. Hesse is named Divisional Chief Engineer; Jack B. Bond, formerly District Manager of these divisions, is now Sales Manager. Harold N. Propp, who was Assistant District Manager, will succeed Mr. Bond. Other appointments are: Ewald Werner, Research and Development Engineer, Crusher Division; Stanley L. Apolant, Research and Development Engineer of the Process Machinery Division, assigned to the New York office; E. F. Zillman, Coordinator of Crusher and Process Machinery Sales; W. J. Brenneman, Henry Behr, and John Kobel, Sales Engineers. Mr. Brenneman's headquarters will be in Toronto, Canada, and those of Mr. Behr and Mr. Kobel in New York.

James H. Burtis has been appointed Sales Engineer in the Four-Cycle Engine Department of Nordberg. Mr. Burtis has a long engineering career to his credit, and has served on Government and private-industry projects both at home and abroad.

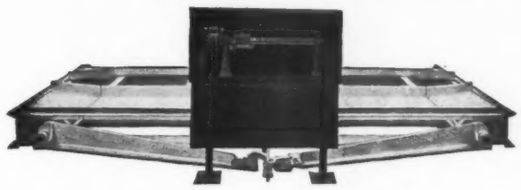
Safety Slogan on Paper Cups

With the thought that safety is everyone's business, the Dixie Cup Co., 24th St. and Dixie Ave., Easton, Pa., now offers a safety design on its No. 154 Vortex cups. The new Dixie cups combine the National Safety Council's Green Cross emblem with a series of thought-provoking safety slogans.

Literature about these cups may be obtained from the company, or by using the Request Card at page 16. Circle No. 104.

WINSLOW—PORTABLE TRUCK SCALE

"THE CONTRACTORS' SPECIAL SCALE"



For use at temporary and permanent locations—at stock piles and by bituminous material contractors at the job site.

Capacities: 15-18-20-30 Ton—Write us for your nearest distributor

Mfd. by: WINSLOW SCALE COMPANY

P. O. Box 1198 Terre Haute, Indiana

Cleaning shoulders and ditches through hard-packed top-soil calls for TRAXCAVATOR power! One of many year-round, money saving jobs completed in Douglas County by the HT4.

YOU NAME IT A TRAXCAVATOR WILL DO IT!

Whatever your job, digging, loading, grading, 'dozing, excavating, stripping, backfilling, land-clearing, ditching, snow-removal—whatever the material—a TRAXCAVATOR will do it . . . faster and cheaper.

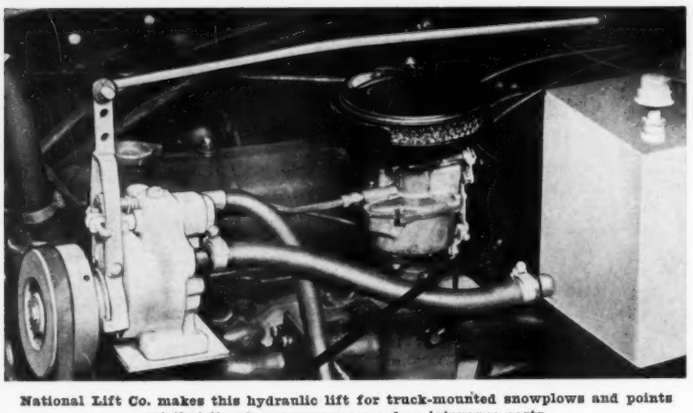
Douglas County, Colorado, uses their versatile HT4 TRAXCAVATOR to clean shoulders and ditches, feed sand and gravel to a screening plant as well as many other jobs throughout the county.

Converting dependable "Cat" Diesel Tractor power to work-power, these economical and rugged tractor-shovel teammates are designed to meet any task. Powerful digging action gets heaped loads every pass . . . balanced design . . . wide tracks allow high gear hauls . . . positive dumping gets all the material out of the bucket . . . high lift gets the load into any hauling unit. And the rear of the tractor is free for drawbar work or installation of other equipment.

There are five TRAXCAVATOR models with capacities from ½ to 4 cubic yards . . . with a full line of attachments to increase job range! See your TRACKSON-"Caterpillar" Dealer or write TRACKSON COMPANY, Dept. CE-91, Milwaukee 1, Wisconsin.

Digging and feeding pit-run gravel to the screen hopper, this hydraulically controlled HT4 TRAXCAVATOR handles over 500 cubic yards a day for Douglas County, Colorado.

TRACKSON
TRACTOR EQUIPMENT



National Lift Co. makes this hydraulic lift for truck-mounted snowplows and points out that it reduces manpower and maintenance costs.

Hydraulic Plow Lift

A hydraulic lift for truck-mounted snowplows has been developed by National Lift Co., 225 Madison St., Waukesha, Wis., a subsidiary of Gar Wood Industries, Inc. It is controlled from a push-button on the dash and can be handled by the truck driver alone, the company says. Because the lift is so quick, the plow escapes destructive grinding over dry areas.

The lift is actuated by a hydraulic pump operated by the engine fan belt, which eliminates battery drain. A clutch on the pump permits it to run only when power is needed. Such intermittent action, it is claimed, adds to the life of the equipment. The clutch pump is also sold separately for remote-control power on any truck with a fan belt.

Further information may be secured from the company. Or use the Request Card that is bound in at page 16. Circle No. 187.

Cartridge-Powered Tool for Fastening

A 5-pound cartridge-powered fastening tool has been developed by Remington Arms Co., Inc., Bridgeport, Conn. Remington's engineers claim the Model 450 stud driver can be operated at a sustained speed of five or more stud settings per minute in concrete, steel, wood, brick, asbestos siding and roofing, and other structural materials. The "energy supplier" is a 32-caliber long rim-fire blank cartridge. A colored plastic heel cap or cup is inserted in the mouth of the cartridge case to indicate the power load.

Using the Model 450 Remington cartridge-powered stud driver, a worker fastens an internally threaded stud to concrete for an eye-bolt installation.

The studs used vary in length from ⅝ to 2¾ inches and are made of special steel alloy. They come in 20 different sizes in 4 general types: standard head (like a nail head), break-off head for semiflush mounting, externally threaded, and internally threaded.

The Remington stud driver is equipped with a number of safety devices. A Neoprene-lined steel guard is attached to the muzzle of the tool; without it the tool cannot be fired. The operator presses the guard firmly against the work surface, depresses the safety button and holds it in that position with one hand, and then fires the tool by squeezing the trigger with the other hand. Failure to follow any one of these steps will prevent the tool from firing. Other features claimed for the tool are its low recoil, lack of explosive noise, and a firing-pin indicator that shows whether or not the gun is cocked.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 209

Booklet on Air Entrainment

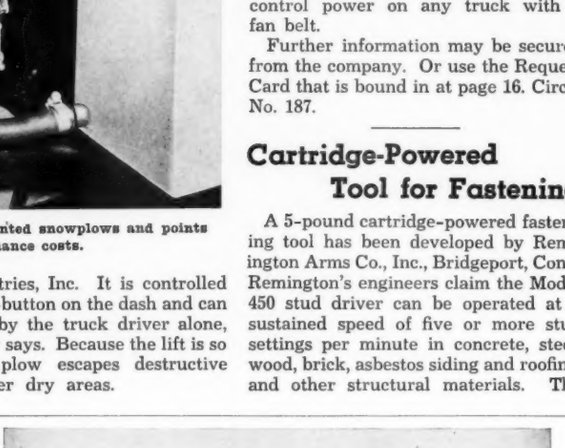
A new and enlarged edition of "Modern Placement of Concrete" has been issued by the Industrial Research Division of Autolene Lubricants Co., 1331 W. Evans St., Denver 9, Colo. It features Protex air-entraining agent.

It contains technical information and field-use tips on air-entrained concrete. It is complete with photographs of recent concrete construction projects, and with questions and answers about air-entrainment technique and Protex air-entraining solutions. Photographs also show actual test pictures of concrete with and without Protex air-entrainment solutions. Many new graphs and charts have been added in the new edition.

This literature may be obtained by writing on company stationery to the Autolene Lubricants Co.

You can't give this little giant

TOO MUCH WORK!



It's 30 cu ft of air power, ready and willing to tackle the host of building jobs that can be powered by air.

You'll find this Worthington Blue Brute portable air compressor has the same stamina as *bigger* Blue Brutes—60 cu ft and larger—and the same top quality of design and construction.

Ruggedly built 2-stage compressor. Light over-all weight for convenient towing, easy spotting. Worthington's famous Feather* Valve. Spring-mounted axle. Telescoping leg support. Special industrial model available for use in limited space.

See the "Blue Brute 30" at your Worthington distributor. Write for bulletin to Worthington Pump and Machinery Corporation, Construction Equipment Division, Dunellen, N. J.

*Reg. U. S. Pat. Off.

USE IT FOR

Breaking • digging • trenching • tamping • paint guns • scalers • sprayers • inflating tires • carving tools chippers • small riveters • nut setters • wood borers.

BUY BLUE BRUTES

WORTHINGTON

H.1.7

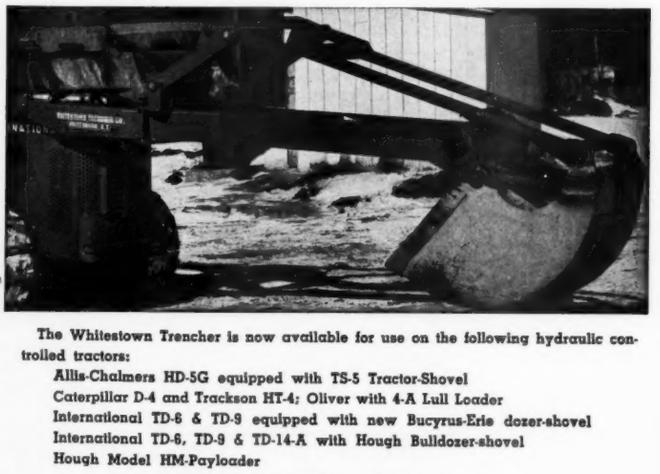
HEAVY-DUTY TRENCHER

WITH NEW IMPROVED SELF CLEANING BUCKET — Capacity ½ yd.

A heavy-duty trench digger, which is designed for a wide variety of trenching for any highlift tractor with hydraulic bucket control.

It will increase the tractor's production from 30 to 50 per cent. and is easily attached by one man in 15 minutes.

The Whitestown trencher is equipped with a ½-yard standard bucket. Special buckets, made to individual specifications, may be obtained. It will dig to a depth of 8 feet and dump at a height of 12 feet. This trencher has been in constant use for four years, and has proved to be rugged and satisfactory in every way.



The Whitestown Trencher is now available for use on the following hydraulic controlled tractors:

Allis-Chalmers HD-5G equipped with TS-5 Tractor-Shovel
Caterpillar D-4 and Trackson HT-4; Oliver with 4-A Lull Loader
International TD-6 & TD-9 equipped with new Bucyrus-Erie dozer-shovel
International TD-6, TD-9 & TD-14-A with Hough Bulldozer-shovel
Hough Model HM-Payloader

● *Please specify make of tractor.*

● *Immediate delivery can be made.*

WHITESTOWN TRENCHER CO., INC.
Wood Road, Whitesboro, New York — Phone: Utica 6-1117

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By C. W. Lindgren, 2nd Printing.

For instruction to students in Transportation, Civil Engineering and Military Operations. A needed reference book for use and study by anyone engaged in the management or ownership of trucks, loading equipment, shovels, cranes, tractors, scrapers, bulldozers, motor graders, rollers, trenching machines, paving equipment and sand and gravel equipment. Endorsed by twenty-six technical editors. 290 pages. 120 instructive sketches, $4.50, includes postage in U. S.

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Plant-Mix Is Laid On Concrete Base

Section of U.S. 1 in Virginia Is Widened From 18 to 24 Feet; 3-Ton Pugmill Plant on Siding Near Project Supplies Asphalt

• ONE of the many major highway improvements completed in Virginia this year was on U. S. 1 in Mecklenburg County, beginning at a point just north of the intersection of U. S. 58, below South Hill, and continuing south to the North Carolina line. This 8.88-mile stretch was widened in part with a plain-concrete base, and the entire width then topped with plant-mix asphaltic concrete. The section that had been widened in previous years was given a new blacktop surface only.

The original 18-foot-wide concrete pavement on this road was put down in 1927, and has a thickness of 8 inches. During 1938 and 1939, portions of this piece of road were widened at both the north and south ends with the addition of a 12-foot lane, bringing the total width to 30 feet. The intermediate section, nearly 3 miles long, was widened in the current improvement with a 6-foot strip along the west side, increasing the width from 18 to 24 feet.

Construction on the U. S. 1 project got under way in December, 1950, after the Virginia Department of Highways awarded a contract for the work to T. E. Brown of Charlotte, N. C., on a low bid of $319,706. The entire job was completed by September.

Patching and Base Work

During the winter of 1950-1951, the work carried on consisted chiefly of grading. Dirt-moving for the 6-foot widening strip was handled by shovels and trucks, with the final shaping done by a motor grader. An extra 6 inches was cut out below grade, and backfilled with gravel as a foundation course for the concrete base. Gravel was obtained from a pit about midway of the job. After being spread out by a grader blade, it was compacted by a tamping roller.

Wherever the original pavement was found to be in bad shape, those areas were cut out and replaced with a concrete patch also 8 inches thick. The bulk of this patching occurred in the stretch that had not been widened, where the traffic was concentrated on the 18-foot slab. In one area immediately south of the 1,300-foot bridge crossing the Roanoke River, a section of old pavement 1,100 feet in length was torn out completely, the grade raised, and a new 24-foot base was laid.

Concrete for the patching, base course, and widening was delivered to the forms in three transit-mix trucks that had been loaded at a batch plant set up by the side of the road at about the center of the widening. A Winslow 3-bin batcher was erected on a side-hill so that the truck mixers drove under and were filled by gravity. Southern Materials Co. of Hopewell, Va., supplied the aggregate, delivering it by rail to South Hill on the Atlantic & Danville railroad whence it was trucked 12 miles to the plant. Lehigh bag cement from the Fordwick, Va., mill was also shipped to the batcher by rail and truck. A P&H crane, with a 35-foot boom and an Owen ¼-yard clamshell bucket, charged the batcher bins with aggregate from the stockpiles.

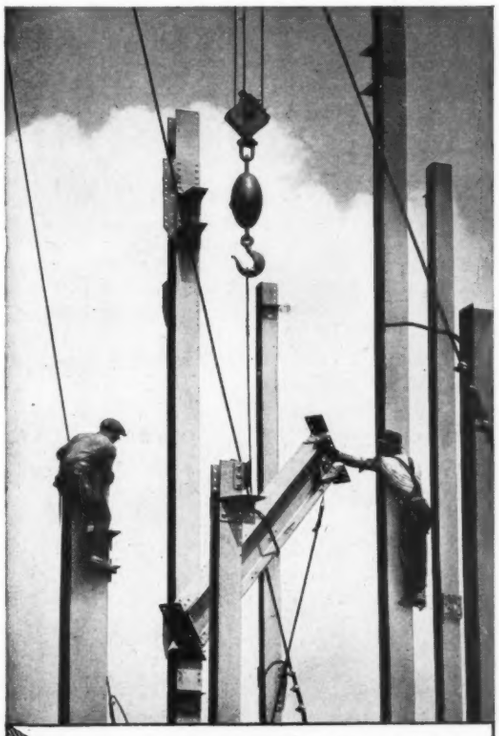
Water for the truck mixers was piped to a tank at the batch plant from a lake 1,500 feet away. Both Blaw-Knox

(Continued on next page)

C. & E. M. Photo

For its blacktopping subcontract Adams & Tate set up this Cummer 3-ton pugmill asphalt plant off U. S. 1 below South Hill.

WIRE ROPE



ROEBLING ALL-PURPOSE SLINGS with the Tapered Sleeve Splice come to you ready for the job. They cost less than tucked splices... have the full strength of the rope. Send for the full story.

On every type of equipment you'll do best with Roebling

"BLUE CENTER" STEEL wire rope is an exclusive Roebling development. It has to pass the most stringent tests for strength, fatigue and abrasion resistance . . . gives rope the extra life that spells economies. Besides, Roebling Preforming assures you top performance on the job. "Blue Center" Preformed is easy to handle . . . has better spooling qualities . . . reduces vibration and whipping.

Roebling makes a complete line of wire rope . . . offers the right grade and construction for every installation. Have your Roebling Field Man help choose the *right* rope for your equipment. Get his advice on the correct use and maintenance of wire rope. It is based on performance records on thousands of installations. John A. Roebling's Sons Company, Trenton 2, New Jersey.

ROEBLING

Atlanta, 934 Avon Ave ★ ***Boston,*** 51 Sleeper St ★ ***Chicago,*** 5525 W. Roosevelt Rd ★ ***Cincinnati,*** 3253 Fredonia Ave ★ ***Cleveland,*** 701 St. Clair Ave, N.E. ★ ***Denver,*** 4801 Jackson St ★ ***Detroit,*** 915 Fisher Building ★ ***Houston,*** 6216 Navigation Blvd ★ ***Los Angeles,*** 216 S. Alameda St ★ ***New York,*** 19 Rector St ★ ***Odessa, Texas,*** 1920 E. 2nd St ★ ***Philadelphia,*** 230 Vine St ★ ***San Francisco,*** 1740 17th St ★ ***Seattle,*** 900 1st Ave, S. ★ ***Tulsa,*** 321 N. Cheyenne St ★ Export Sales Office, ***Trenton, N. J.***

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SPRAGUE & HENWOOD, Inc.

Dept. C, Scranton 2, Pa.

Plant-Mix Is Laid On Concrete Base

(Continued from preceding page)

and Heltzel road forms were used in the concreting. The exact section was cut by a subgrade planer pulled by a Centaur rubber-tired tractor. When the transit mixers discharged their loads the concrete was leveled off by a Jaeger-Lakewood two-screed finishing machine. A single pass sufficed, and no further finishing was necessary since the base course was all covered with blacktop. Richcure membrane compound was sprayed on the surface to cure the concrete.

Subcontractor on Plant-Mix

Concrete work started in the spring, and by the middle of June was far enough along for blacktopping to begin. The plant-mix end of the contract was sublet to Adams & Tate Construction Co. of Roanoke, Va. The subcontractor set up a Cummer 3-ton pugmill asphalt plant off U. S. 1 below South Hill, on a siding of the Atlantic & Danville Railroad. Sand for the bituminous concrete came from the Bryan Sand & Gravel Co. of Petersburg, Va., and crushed limestone for the coarse aggregate was supplied by the Trego Stone Co. of Emporia, Va.

Two cranes were at the plant for unloading aggregate from the cars, building stockpiles, and feeding the 35-ton receiving hopper. They were a Koehring 205 with a 35-foot boom and an Owen ⅝-yard clamshell bucket, and a Lima equipped with a 40-foot boom and an Owen ¾-yard bucket. The Texas Co. of Norfolk, Va., supplied the bitumen for the job, while the Asphalt Service Co. of Portsmouth, Va., delivered it to the plant in 3,000-gallon trailer tank trucks. AP-3 asphalt cement with an 85 to 100 penetration was used in the mix, and was stored in two tanks, one holding 10,000 and the other 6,000 gallons.

Bunker C fuel oil for the boiler and dryer was also delivered by Asphalt Service Co. and stored in an 8,000-gallon tank. A lighter No. 2 oil for starting the burners was contained in a 600-gallon tank. Water for the boiler and general plant use was tapped from city hydrants in South Hill into a 1,000-gallon tank truck which filled four tanks at the plant having a total capacity of 7,000 gallons.

C. & E. M. Photo

Plant-mix on the Virginia improvement was laid by this Barber-Greene Finisher. A Buffalo-Springfield tandem roller follows.

Asphalt Plant

From the receiving hopper, the sand and crushed-stone aggregate went up a 20-foot cold elevator to a dryer 25 feet long x 5 feet in diameter, heated by two burners. An exhaust fan drew off the fines to a dust collector which passed them along to the bottom of the hot elevator. This enclosed bucket elevator raised all the aggregate to the 8½ x 4-foot screens that segregated

(Concluded on next page)

Atlas

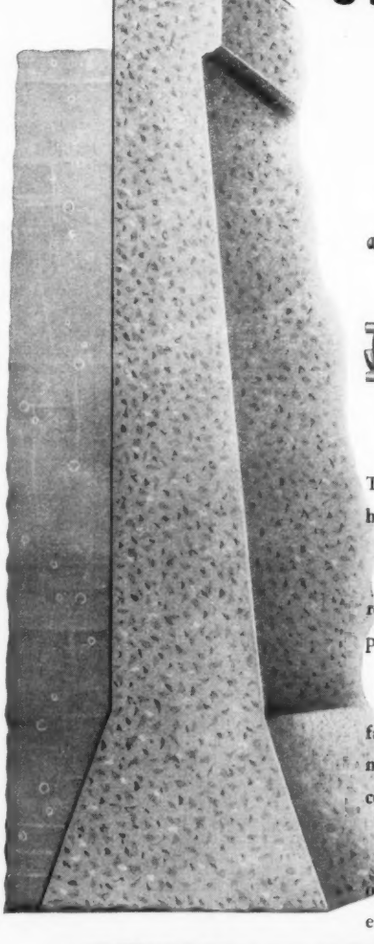
STEEL SYSTEM of Concrete Form Speed Construction

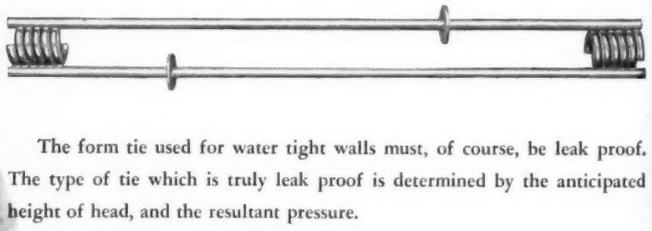
SAVINGS of 1/3 to 1/2 and over 500 uses are reported by contractors everywhere. All steel SPEED forms can be set up, stripped, cleaned, moved and reused in far less time than wood. Interchangeable on job after job, year after year—Walls, slabs, circular tanks, manholes, tunnels, etc. For complete facts write Dept. ME.

IRVINGTON FORM & TANK CORP.
20 Vesey Street
New York, N. Y.

For Watertight Walls . . .

USE SUPERIOR Water-Seal COIL OR SNAP TIES



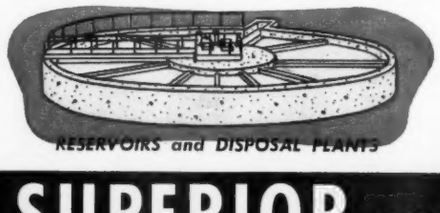


The form tie used for water tight walls must, of course, be leak proof. The type of tie which is truly leak proof is determined by the anticipated height of head, and the resultant pressure.

Superior Snap Ties, and standard and Cone-fast Coil Ties, give satisfactory results for low heads, but for high heads, the use of Superior Water Seal Ties provide a real and justifiable insurance against leakage.

Superior Water Seal Snap Ties, and Coil Ties, both standard and Cone-fast, are provided with a water stop in the form of a securely fixed washer near the middle of the tie as illustrated. This washer effectively breaks the continuity of the rods, preventing seepage along the tie.

On any forming job, use SUPERIOR Concrete Accessories and be assured of the best in material, design and workmanship . . . plus the services of our experienced engineers who are always available to help plan your form work.



RESERVOIRS and DISPOSAL PLANTS

FLOOD WALLS

SUPERIOR CONCRETE ACCESSORIES, INC.
4110 Wrightwood Avenue, Chicago 39, Illinois
New York Office: 1775 Broadway, New York 19, N. Y.
Pacific Coast Plant: 2100 Williams St., San Leandro, Calif.

the material into the proper bins.

The plant asphalt pump unloaded the bitumen from the supplying tank trailers into the storage tanks, and also moved it along to the mixing tower through a 3-inch steam-jacketed line. A locomotive-type boiler operating at 120-pound pressure supplied the steam for plant use. Batches weighing 2½ tons were mixed for 45 seconds in the 3-ton pugmill, then discharged into trucks that had backed under the plant tower. Trucks were hired on a ton-mileage basis, and their weights were checked on a Winslow beam scale as they left the yard.

As many as 10 trucks, averaging 7½ tons a load, hauled the plant-mix, which was laid at a temperature of between 275 and 300 degrees F. The maximum haul distance was 10 miles.

A Caterpillar 13000 diesel engine, with a 176-hp rating, drove the cold elevator, dryer, and pugmill. The other functions of the plant, including the hot elevator, shaker screens, etc., operated off electric power supplied by an International UD-18 diesel engine hooked up with a Westinghouse 62.5-kva generator.

The Mix

The weights of the 2½-ton batches, both binder and surface courses, were:

Binder	
Coarse aggregate, 1-inch down	1,000 lbs.
Fine aggregate, No. 10 sieve down	3,750 lbs.
Bitumen	250 lbs.
Total	5,000 lbs.

Surface	
Coarse aggregate, ¼-inch down	900 lbs.
Fine aggregate, No. 10 sieve down	3,750 lbs.
Bitumen	350 lbs.
Total	5,000 lbs.

The gradation of the mixes by volume fell within these limits established by the specifications:

	Per Cent Passing	
Sieve Size	H-2 Binder	F-1 Surface
1-inch	100	....
¾-inch	95—100	....
⅜-inch	60— 80	100
No. 4	40— 60	85—100
No. 10	20— 40	65— 95
No. 40	....	20— 45
No. 80	3— 10	5— 30
No. 200	....	2— 12
Asphalt	4.5—5.5	7— 8

Before any plant-mix was laid, the concrete base was first given a tack coat of RC-2 asphalt applied from an Etnyre 1,000-gallon distributor at the rate of 0.1 gallon to the square yard. The binder was laid to a compacted depth of 1¾ inches and the surface course 1⅜ inches. All the plant-mix was laid by a Barber-Greene Finisher and compacted by a pair of Buffalo-Springfield tandem rollers, a 12-ton first, followed by a 10-ton.

Paving started at the North Carolina line and proceeded northerly. The usual procedure was to lay binder for five days, covering a section of the road to the full width, then drop back and put on the surface course. On the 30-foot pavement the finisher was set for 10-foot lanes, and on the 24-foot stretch the paving was done in 12-foot strips. In a 12-hour day the blacktop crew averaged 750 tons of binder or 550 tons of the surface course.

Quantities and Personnel

On the 6-foot widening strip, the 8-inch plain-concrete base is pitched to the edge of the pavement at the rate of ¼ inch to the foot. Flanking the pavement are 10-foot shoulders with a slope of 1 inch to the foot. In embankments over 10 feet in height the fill slopes are 2 to 1, while where the fills are less than 10 feet the slopes are 4 to 1. All cut slopes are 2 to 1.

The major items in the 8.88-mile highway contract included:

Excavation	85,065 cu. yds.
Concrete patching, 8-inch	5,000 sq. yds.
Cement-concrete base (widening) 8-inch	12,135 sq. yds.
Bituminous concrete, binder	[illegible] tons
Bituminous concrete, surface	9,722 tons

Adams & Tate Construction Co. employed a crew of 12 at the asphalt plant and 7 on the blacktop paving, under the direction of J. C. Heizer, Superintendent at the plant, and Wallace Campbell, Superintendent on the paving. Morris Gordon was Superintendent for the general contractor, T. E. Brown.

For the Virginia Department of Highways, L. O. Bolton was Resident Engineer, assisted by Inspectors R. T. Clark and B. C. Medlock. The project is located in the Richmond District of which P. W. Snead is District Engineer. The Department is headed by Gen. James A. Anderson, Commissioner, with C. S. Mullen, Chief Engineer. T. F. Loughborough is Construction Engineer.

Disston Appoints Thayer

Joseph T. Thayer, Jr., is now Chief Sales Engineer for Henry Disston & Sons, Inc., Philadelphia, Pa. He joined the firm in 1947, and from 1949 until his present appointment he was Chain Saw Service Manager.

How to get more roadwork out of a heavyweight

ONE way in which the Buffalo-Springfield Roller Company builds more work output into its heavy-duty rollers is by mounting the king pin assembly on Timken® tapered roller bearings.

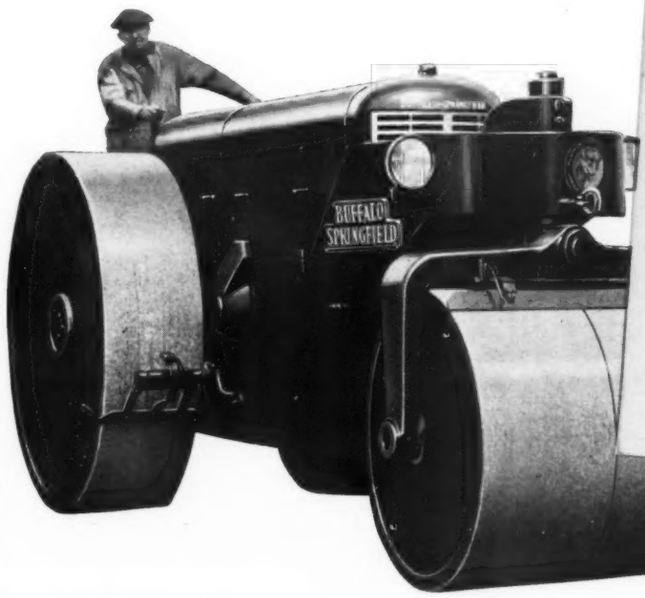
This makes steering easier and prevents any vertical motion or shimmy in the guide roll. Result—easy handling even on rough terrain. Timken bearings are also used in the differential as well as on the intermediate and bull pinion shafts. This assures a smooth flow of power—cuts maintenance and lubrication time.

Because of line contact between rollers and races, Timken bearings have exceptional load-carrying capacity. The true rolling motion and smooth surface finish of rollers and races enable them to operate freely, frictionlessly. Since they take radial and thrust loads in any combination, Timken bearings hold shafts in rigid, positive alignment, insuring proper gear meshing at all times.

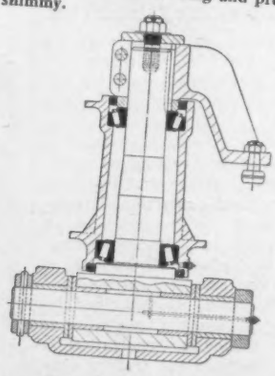
Closures are more effective because Timken bearings keep housing and shaft concentric. Lubricant stays in, dirt stays out. Timken bearings will normally last the life of the machine in which they are used because they're engineered for the job, precision manufactured, and made of Timken fine alloy steel.

First choice of the construction industry, Timken bearings give you more advantages than any other bearing. Be certain they are in the equipment you buy, or the equipment you build. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



How the **BUFFALO-SPRINGFIELD ROLLER COMPANY** uses Timken bearings on king pin to assure easy steering and prevent shimmy.



DESIGN LEADERSHIP

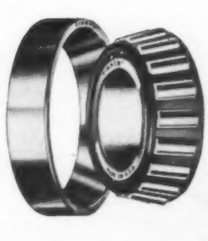
The first Timken tapered roller bearing was produced in 1898. Since then the one-piece multiple perforated cage, wide area contact between roll ends and ribs, and every other important tapered roller bearing improvement have been introduced by The Timken Roller Bearing Company.

The Timken Company leads in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis steels.

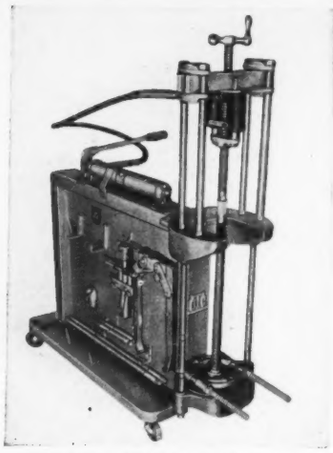
TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ⬮ AND THRUST ⬭◎⬭ LOADS OR ANY COMBINATION



The Hydra-Tote takes pulling tools to the job. It holds the complete OTC hydraulic pulling system and a 17½-ton hydraulic press.

New Portable Units Carry Tools to Job

A portable unit which takes pulling tools to the job has been announced by Owatonna Tool Co., 381 Cedar St., Owatonna, Minn. The Hydra-Tote holds the complete OTC hydraulic pulling system and a 17½-ton hydraulic press. It provides a place for the puller set, permanent steel hangers for basic items, and a tray for extra parts to reduce the danger of losing or misplacing tools.

The Hydra-Tote is 32 inches high, 36½ inches long, 16 inches wide at the base, and 4 inches wide at the top. There are 10½ inches of clearance between the press uprights, 11 inches of clearance from the ram to the top of the press plate, and 34 inches from the top of the press plate to the floor. Vertical adjustment is possible with interchangeable legs in the upper press frame and three adjustments in the lower press frame. Three-inch rubber casters make the unit easy to move.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 203.

New Water Repellent For Masonry Surface

A transparent, colorless, silicone-base masonry seal with water-repellent qualities for above-grade exterior application is announced by the Surface Protection Co., 16803-C Euclid Ave., Cleveland, Ohio. Silaseal contains a special silicone formula designed specifically for stone, brick, concrete-block, and masonry joint protection. It contains no wax or oils and provides an invisible coating for masonry pores, penetrating to depths of ⅜ inch below the surface, the company says.

In some instances Silaseal need be applied only to "weather" walls or to those where moisture penetration is experienced, because the treated surface looks just like the adjacent untreated areas, according to the manufacturer. Its transparency is important for treatment of natural stone, decorative brick, sills, and trim.

The company points out that soot and dirt cannot cling to the treated surface but wash off after each rainfall; and that the treated surface resists the freeze-thaw cycle which creates cracks and crevices in mortar and stonework. Silaseal may be applied by brush or spray in summer or winter. One thorough application is generally sufficient, the manufacturer says.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 206.

Ingalls N. Y. Sales Manager

Ross Anderson has been appointed Sales Manager of the northern division, The Ingalls Iron Works Co., Birmingham, Ala., with headquarters in the company's New York office. Mr. Anderson, formerly General Manager of the firm's Verona Works in the Pittsburgh district, joined Ingalls in 1931. He succeeds Kenneth H. Gayle, Jr., now President of the company.

A Heavy-Duty Drill

A new model of the ¼-inch Holgun drill has been introduced by The Black & Decker Mfg. Co., Towson 4, Md. It features full-sized ball bearings, heat-treated gears, splined gear shafts, and smooth-contour aluminum housings. It is an end-handle unit and is available for standard or low speed. The standard-speed unit has a no-load speed of 1,700 rpm (optional 2,500, 3,500, or 5,000 rpm). The low-speed unit has a no-load rating of 600 rpm (1,000 rpm optional).

A new handle with plenty of finger room features the improved Holgun ¼-inch drill—made by Black & Decker.

The Holgun weighs 3¼ pounds and is powered by a Black & Decker universal motor. It is available for 115 or 220-volt power lines. Standard equipment includes a 2-pole automatic-release trigger switch and locking pin, a 3-wire cable and plug, and a 3-jaw geared threaded chuck and key.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 127.

Data on Steam Cleaners

A 4-page catalog on steam cleaners is offered by Malsbary Mfg. Co., 845 92nd Ave., Oakland 3, Calif. It tells the difference between the steam-vapor and the heavy-duty models and suggests where each model best fits. It contains specifications, on-the-job illustrations, and descriptions, and lists standard accessories.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 126.

When economy is vitally important...

that Pioneer Edge

How Pioneer equipment did the job

Aggregate consisting of ¾" and 1½" quartzite arrived in bottom dump cars. It was stacked with a PIONEER reciprocating feeder loading a PIONEER 24" inclined belt conveyor equipped with a swiveled chute at its upper end. This either delivered material directly to a 50 foot rock ladder or to one of the two 115 foot 24-inch belts discharging to rock ladders serving the stockpiles. Capacity was 276 tons per hour.

Three gates under each stockpile delivered aggregate to an 18-inch belt which carried it by an underground-overground conveyor to the batch plant 835 feet away.

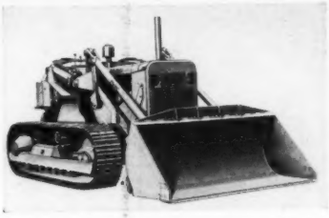
BUY BOTH! HIGHER OUTPUT LOWER UPKEEP

Pioneer Continuflo EQUIPMENT

New Tractor-Shovels

Four Tracto-Shovel models with standard bucket capacities up to 4 yards and light-material buckets up to 7 yards, are now available, according to a joint announcement by Tractomotive Corp., Deerfield, Ill., and the Tractor Division of Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

The new larger Tracto-Shovels, Models HD-9G, HD-15G, and HD-20G, are similar in design to the 1-yard-capacity HD-5G. The HD-9G mounts a 2-yard bucket and dumps at a maximum height of 11 feet 4½ inches. The HD-15G employs a 3-yard bucket and has a dumping height of 12 feet 8 inches. And the HD-20G, torque-converter-driven tractor, uses a 4-yard bucket dumping at a height of 13 feet 5 inches.



Three new Tracto-Shovels have joined the HD-5G—the HD-9G, HD-15G, and HD-20G. They have standard bucket capacities up to 4 yards and light-material buckets up to 7 yards.

Special buckets for handling light materials are available for all four models and range in capacity from 2 yards on the HD-5G to 7 yards on the HD-20G. Tractomotive Corp. has made available for most models a variety of interchangeable attachments, including special buckets, snowplows, bulldozer blades, and rock forks, which can be removed or installed in a matter of minutes, the company says.

Further information may be secured from Allis-Chalmers. Or use the Request Card at page 16. Circle No. 198.

Data on Land Leveling

A broadside on land leveling and soil conservation with the Eversman land leveler is now available from Eversman Mfg. Co., 1145 Fifth St., Denver, Colo. It illustrates and describes in detail the features of various models—in particular, the crank axle for automatic leveling action.

This literature may be obtained from the company or by using the Request Card at page 16. Circle No. 107.

Because it has a short tail swing and requires no stiffegs or guy lines, the Clyde W-3 steel derrick occupies a minimum of ground space.

Revolving Derrick

A self-contained full-revolving steel derrick is announced by The Clyde Iron Works, Inc., Duluth 1, Minn. It is available with either gasoline or electric power and can be swung by hand or power. Since it has a short tail swing of 5 feet 6 inches and requires no stiffegs or guy lines, the Model W-3 occupies a minimum of ground space, the company says.

The rotating structure which supports the boom and boom-supporting members also supports the hoisting machinery. This, according to Clyde, helps provide counterweight for additional stability when swinging loads. The complete rotating structure is centered on a cast-steel turntable by means of a bronze bushed center pin and is supported by 4 double-tapered antifriction bearing rollers.

Boom lengths of 20, 30, or 40 feet are available with load capacities from 2,000 pounds at a 40-foot radius to 10,000 pounds at a 10-foot radius.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 120.

Overlay Electrode

A hard-overlay electrode to resist severe abrasive wear and friction has been introduced by Eutectic Welding Alloys Corp., 172nd St. and Northern Blvd., Flushing 58, N. Y. EuteChrom 2X for ac-dc arc welding is a FrigidArc flux-coated alloy that deposits strong, dense overlays with good corrosion resistance at low amperages, the company says, thus minimizing dangers of distortion and stress. It is available in ⅛, 5/32, ¼, and 3/16-inch diameters. Eutectic recommends it for use with carbon and alloy-steel surfaces that are subjected to severe abrasive wear and comparatively mild impact.

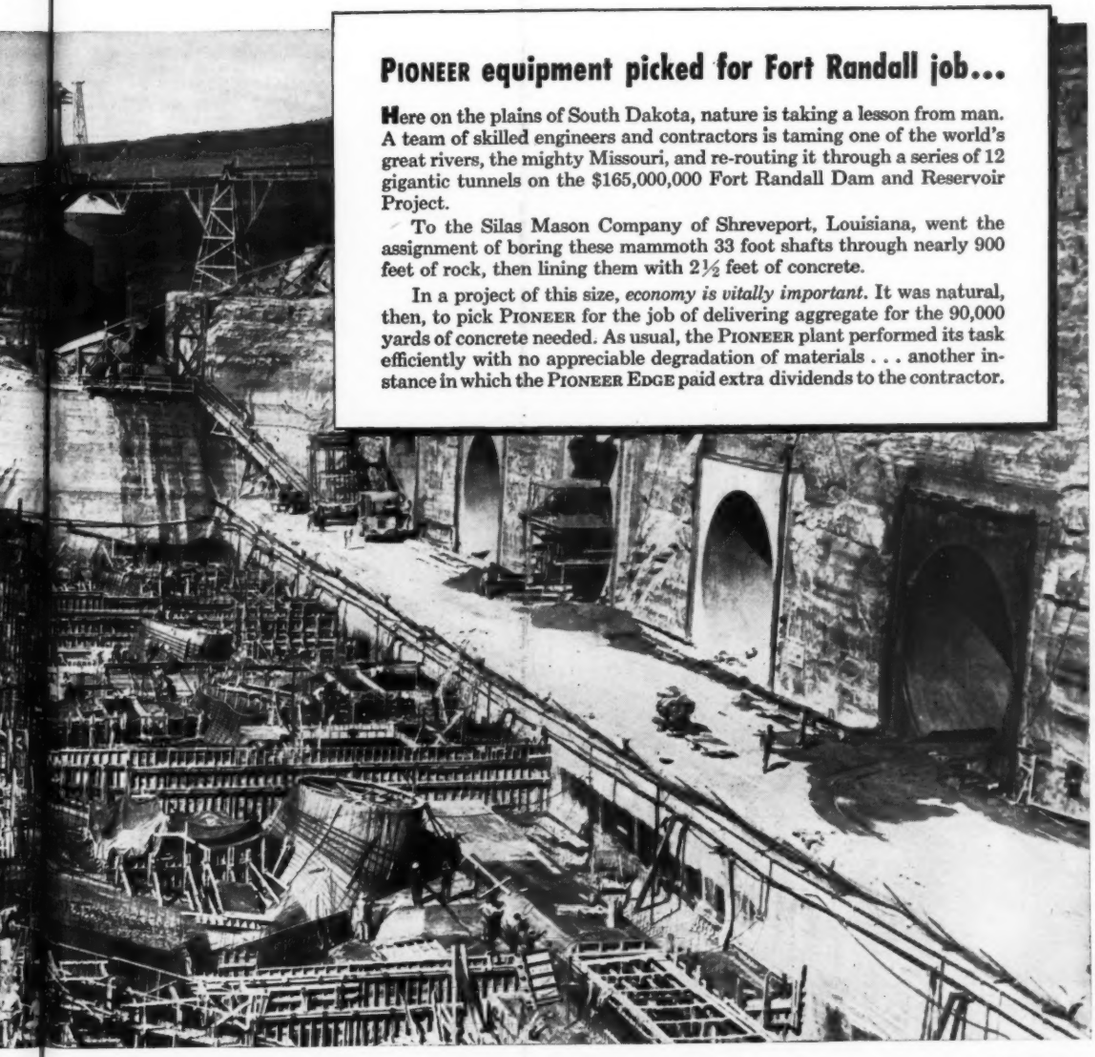
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 219.

Brochure on Steel Products

A 32-page brochure on steel-plate and structural products is offered by Pittsburgh-Des Moines Steel Co., Neville Island, Pittsburgh 25, Pa. It begins with a historical note on the development of the company and shows production facilities of P-DM's three plants. Then it illustrates and describes elevated steel tanks and a variety of steel reservoirs and standpipes, non-pressure liquid storage tanks, and bins for the storage of dry, free-flowing materials. Special sections are devoted to steel-deck grandstands, bridges, and structural steelwork. The catalog also pictures P-DM industrial buildings, heavy steel platework, radio towers, U. S. Navy advance base docks, and pontoon gear units.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 178.

eans rock bottom costs



PIONEER equipment picked for Fort Randall job...

Here on the plains of South Dakota, nature is taking a lesson from man. A team of skilled engineers and contractors is taming one of the world's great rivers, the mighty Missouri, and re-routing it through a series of 12 gigantic tunnels on the $165,000,000 Fort Randall Dam and Reservoir Project.

To the Silas Mason Company of Shreveport, Louisiana, went the assignment of boring these mammoth 33 foot shafts through nearly 900 feet of rock, then lining them with 2½ feet of concrete.

In a project of this size, *economy is vitally important.* It was natural, then, to pick PIONEER for the job of delivering aggregate for the 90,000 yards of concrete needed. As usual, the PIONEER plant performed its task efficiently with no appreciable degradation of materials . . . another instance in which the PIONEER EDGE paid extra dividends to the contractor.

hat the Pioneer Edge meant to Silas Mason

At Fort Randall, PIONEER equipment again showed its exceptional capacity for efficient, low cost handling of sand and aggregate. Especially important was the fact that it eliminated breakage of materials and made it readily possible to adhere to strict government specifications.

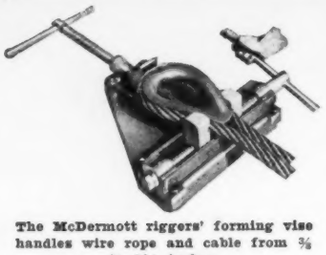
"The system functioned economically and we were well satisfied with its performance," reports R. B. Jewell, Silas Mason's Resident Engineer in charge of the project.

PIONEER ENGINEERING WORKS
1515 Central Avenue • Minneapolis 13, Minnesota
SUBSIDIARY OF POOR & COMPANY, CHICAGO

● Please send me information on the equipment checked.

☐ CONTINUFLO CONVEYORS	☐ GRAVEL PLANTS	☐ WASHING PLANTS
☐ MECHANICAL FEEDERS	☐ ROCK PLANTS	☐ BITUMINOUS PLANTS
☐ VIBRATING SCREENS	☐ JAW CRUSHERS	☐ APRON FEEDERS
☐ BUZZER SCREENS (LIGHT DUTY)	☐ ROLL CRUSHERS	☐ ORO FEEDERS

*Name*_____
*Company*_____
*Address*_____
*City*_____ *Zone*____ *State*_____



The McDermott riggers' forming vise handles wire rope and cable from ⅜ to 1¼ inches.

Rope-Forming Vise

The McDermott riggers' vise for forming and holding wire rope and cable in the desired position is manufactured by Big Four Machine & Supply Co., 1013 Hales Bldg., Oklahoma City, Okla. It is designed to save time in forming wire rope and cable around thimbles or fixtures, for making slings, for either splicing or U-clamp and clip installations. The vise handles wire rope and cable from ⅜ to 1½ inches without use of adapters.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 116.

Torsional Stresses in Beams

The usual tables of safe loads on structural beams assume that all the forces are applied in the plane of the beam web. If any of the forces are applied outside that plane, or in any manner apply a twisting movement in a plane transverse to the beam web, then torsional stresses are introduced, which must be taken into account in determining the beam capacity. A record of the formulas covering certain typical cases, and a tabulation of values of several complicated functions of these formulas, are provided in Booklet S-57, "Torsional Stresses in Structural Beams", prepared by Bethlehem Steel Co., Bethlehem, Pa.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 139.

Cots, blankets, stretchers, operating tables, oxygen outlets, and other medical supplies travel right to the job in this hospital-on-wheels.

Mobile Medical Unit

A trailer-mounted hospital-on-wheels is available for large or isolated jobs. It comes completely equipped with two foiding operating tables, 9 oxygen outlets, automatic power generator for lighting, 30-gallon water storage tank, electric water heater, automatic switch-over for dual oxygen-tank supply, built-in sink with hot and cold faucets, storage battery for starting generator, electric-light outlets throughout, ample storage space for medical supplies, cots, and blankets, and two Collapsi-Cot emergency stretchers. The medical treatment rendered from this unit can be expanded according to the amount of medical supplies, splints, and plasma stocked in it.

The self-contained unit is 6½ feet wide, 10 feet long, and 5½ feet high. It is built on a steel-frame heavy-duty combat chassis, with body construction that is sturdy, yet light and compact. It weighs about 1,900 pounds and is well balanced for road travel through debris and rough terrain, the manufacturer says. The simple car hitch on the unit fits practically any car bumper.

The Collapsi-Cot stretchers are manufactured by Emergency Aids Co., 3444 N. Clark St., Chicago 13, Ill., which is also national distributor for the trailer unit.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 103.

Boiler Safety Controls

A handy 8-page circular on a line of boiler controls and safety devices has been issued by McDonnell & Miller, Inc., 3500 N. Spaulding Ave., Chicago 18, Ill. It gives essential data on boiler water feeders, low-water cutoffs for low-pressure steam boilers, pump controls and cutoffs for higher-pressure steam boilers, and pressure relief valves for use on hot-water heating boilers. It includes illustrations, capacities, and service recommendations.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 177.

GULF PRODUCTS *and* FINE SERVICE

keep equipment rolling

on Donaldson Air Base Project

Dickerson, Inc., Monroe, North Carolina, has the contract for the construction of extensions and modifications of NE-SW runways at the Donaldson Air Base at Greenville, South Carolina. The project involves the excavation of 1,165,000 cubic yards of earth and 200,000 square yards of concrete paving.

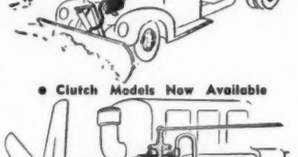
ANOTHER big earth-moving project where Gulf lubricants and fuels work as a team to keep the job rolling smoothly — and ahead of schedule.

Like many other leading contractors, Dickerson, Inc. has found that the extra quality of Gulf petroleum products is reflected in an extra margin of performance for equipment, fewer delays, and lower maintenance costs.

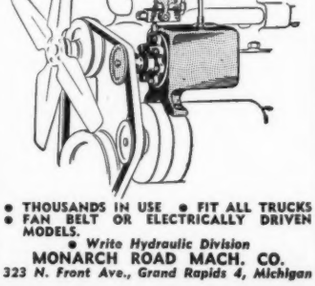
Write, wire, or phone your nearest Gulf office and arrange to use Gulf lubricants and fuels on your next job. They are quickly available to you through more than 1400 warehouses located in 31 states from Maine to Arizona. Gulf Oil Corporation · Gulf Refining Company, Pittsburgh 30, Pennsylvania.

FIFTY YEARS OF SERVICE
1901 GULF 1951
PETROLEUM AND ITS PRODUCTS

POWER HYDRAULICS
for Snow Plows



• Clutch Models Now Available



• THOUSANDS IN USE • FIT ALL TRUCKS
• FAN BELT OR ELECTRICALLY DRIVEN MODELS.
• Write Hydraulic Division
MONARCH ROAD MACH. CO.
323 N. Front Ave., Grand Rapids 4, Michigan

Civil Engineers Hold Annual Fall Meeting

ASCE Installs Carlton S. Proctor as President at Ninety-Ninth Annual Business Meeting in New York City

CURRENT happenings in all divisions of the civil-engineering profession were touched on at the Annual Fall Meeting of the American Society of Civil Engineers, held in New York City from October 22 to 26 inclusive. Over 1,000 members attended the 5-day sessions at the Statler Hotel, which included the ninety-ninth annual business meeting during which Carlton S. Proctor, New York consulting engineer, was installed as President. In addition to the usual technical sessions, a general session on civil-military liaison was scheduled, in view of the emphasis now being placed on engineering and construction in the various branches of the armed forces.

Divisions presenting papers and holding discussions included: Power; Surveying and Mapping; Air Transport; Hydraulics; Waterways; Sanitary Engineering; City Planning; Soil Mechanics and Foundations; Structural; and the Engineering Mechanics Division. (It was the first time the Engineering Mechanics Division had held a session at this meeting.)

While no sessions were scheduled for the Construction, Engineering Economics, and Highway Divisions, these three groups teamed up with the Soil Mechanics and Foundations Division and the Structural Division to hold two joint sessions on the New Jersey Turnpike. The problems encountered in the construction of this new highway included practical examples for all the sponsoring divisions. An ASCE group made an inspection trip over the major portions of the 118-mile facility during the convention week. The Waterways Division also conducted a field trip to Haverstraw, N. Y., where unusual reinforced-concrete boxes are being constructed within a cofferdam. These boxes will eventually be floated 35 miles down the Hudson River where they will support a new shipping pier that will be built at West 15th Street in Manhattan.

Officers Installed

In addition to the inauguration of President Proctor, other new officers were installed. They included George W. Burpee of New York City as Vice President of Zone I, and A. M. Rawn of Los Angeles as Vice President of Zone IV. New Directors for five districts were seated: District 1, Walter D. Binger of New York City; District 2, Frank A. Marston of Boston; District 6, George W. McAlpin of Charleston, W. Va.; District 10, James A. Higgs of Atlanta, Ga.; District 11, I. C. Steele of San Francisco.

In his inaugural address, Carlton Proctor warned the civil engineers that "Civilization is now faced with another false politico-economic ideology, far more insidious and destructive than a Morgenthau Plan or any that has so far challenged our progress. Of course I refer to that philosophy which today appears to permeate much political thinking throughout all Europe and the Western Hemisphere. This is the philosophy of 'something for nothing'; that only a sucker works any harder than he has to; that the modern machine with its straight-line production has eliminated the need for industrious work; that ideas are now a natural resource; that profit to the investor, and reward to experience gained through hard work and application, to management, and to creative effort are little short of immoral and can be taxed out of existence without destroying our economy."

Developing this theme President Proctor asserted that "Far too many of us accept the false thesis that moral lassitude in public office, public subsidy of indigence and tax-supported boondoggling, the trading of the dignity and integrity of the individual for a super-state, and the sacrifice of our priceless national heritage of morality, the dignity of work, and the essential place of God in our daily life are but a fair price to pay for the new abundant, indolent life." (See page 3 of this issue for a fuller account of Mr. Proctor's address.)

Presentation of Awards

Various ASCE prizes and medals for papers presented in the 1950 Transactions were awarded during one of the general sessions. Highest of these awards, the Norman Medal, was conferred on D. B. Steinman of New York City, an internationally known bridge engineer and authority on the design of suspension bridges, for his paper on "Aerodynamics Theory of Bridge Oscillations". A Bureau of Reclamation engineer, M. E. Von Seggern, was the recipient of the next-highest award, the J. James R. Croes medal, for his paper on "Integrating the Equation of Non-Uniform Flow". Altogether ten prizes or awards were given.

Military Liaison

The Committee on Military Liaison presented the technical heads of the three armed-service forces—Army, Navy, and Air Corps. Brig. Gen. Colby M. Myers, Staff Engineer, Strategic Air Command, spoke for the U. S. Air

(Concluded on next page)

LOOK AT ALL THE NEW FEATURES on LaPLANT-CHOATE IMPROVED TS 200 MOTOR SCRAPERS

BIGGER CAPACITY
10-cu. yds. struck
13-cu. yds. heaped

BIGGER POWER
Your choice of diesel engines . . .
176 HP BUDA 6DA779
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UP TO 17.6 HP PER STRUCK YARD
For power that's usable in the pit, on the haul and on the fill

Plus ALL THE Original HIGH PRODUCTION FEATURES

HYDRAULICALLY CONTROLLED for direct and instantaneous control of bowl and ejector

HIGH SPEED . . . over 21 mph means more trips per hour on longer hauls

BIG, SAFE, SURE-STOPPING 4-WHEEL AIR BRAKES

Add to these big performance features the easy-loading characteristics, low operating costs and low maintenance typical of all LaPlant-Choate scrapers and you have an agile, powerful unit small enough for small yardage jobs, yet with all the speed and capacity necessary for big production on long haul jobs. See your LaPlant-Choate distributor today for complete details.

For your biggest jobs . . . Use High-Speed TS 300 Motor Scrapers

WHEN your job calls for greater volume, use the high speed and big capacity of the TS 300 Motor Scraper. Speeds in excess of 22 mph assure extra trips per hour . . . Capacities of 14-cu. yds. struck and 18-cu. yds. heaped let you carry extra yards per trip. 280 HP Buda or 275 HP Cummins diesels insure top working speeds for the maximum amount of time. Ask your LPC distributor for facts and figures on TS 300 job-performance.

LAPLANT CHOATE
MANUFACTURING CO., INC. CEDAR RAPIDS, IOWA, U. S. A.

Cable-operated Scrapers in 6-, 8- and 14-yd. sizes for all makes of track-type tractors.

2- and 4-yd. Scrapers for track-type and rubber-tired industrial tractors.

Hydraulic and Cable-operated Dozers.

Civil Engineers Hold Annual Fall Meeting

(*Continued from preceding page*)

Force, and pointed out that changes in design and construction of civilian and military air bases have been necessitated by the increased weight of aircraft, increased tire pressure, and also by the development of jet and rocket-assisted aircraft. U. S. fighter planes used during World War II, according to the general, weighed 10,000 to 14,000 pounds, but today that weight is doubled. Since the war, tire pressure has increased from approximately 75 psi for all types of aircraft to pressures approaching 200 psi for certain fighters and bombers.

Because of varying types of military operations, said the general, the Air Force plans three types of bases; emergency, minimum-operation, and full-operation. Investigations are being made into the effects of jet aircraft on pavements, but more frequent use of rocket-assisted aircraft in the future will present an even greater problem than the jet engine, Gen. Myers intimated.

For the U. S. Navy, Rear Admiral Joseph F. Jelley, Jr., Chief of the Bureau of Yards and Docks, stated that "The Navy civil engineers are again facing many difficult and perplexing problems. Fortunately, we are not hampered by the restrictions of antiquated building codes or similar regulations. New design, new materials, and new methods of construction are adopted when their soundness has been proved."

Lt. Gen. Lewis A. Pick, Army Chief of Engineers, spoke at length in praise of the work performed by the Corps of Engineers and by civilian engineers during the last World War.

Closely related to the military was a paper given before the Hydraulics Division by George W. Rathjens, California consulting engineer, entitled "Design and Construction in Permafrost Areas". Engineering construction in the Arctic, according to Rathjens, is becoming more important every day. Permanently frozen surface materials of the earth, such as muck, sand, gravel and ice, complicate design and construction of dams, buildings, roads, landing strips, and other structures. Permafrost exists over all of northern Alaska, lying in continuous strata or in sheets and lenses separated by permanently thawed material. "To upset the equilibrium which nature has established," warned Rathjens, "is a very serious matter.

"In the solution of any design or construction problem in a permafrost area," he stated, "one of the first decisions which the engineer must make is whether to disturb the permafrost or to arrange construction so that it will not be disturbed." A careful study of all existing factors is required before a forecast can be made of the effect of disturbing this natural equilibrium.

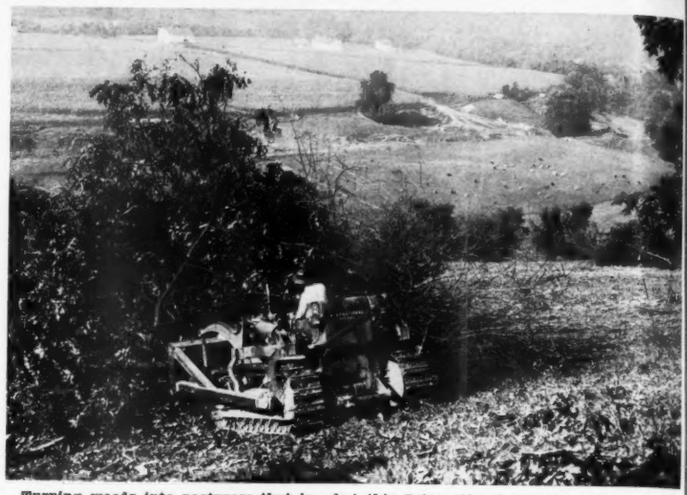
Varied Subjects

With reference to the Delaware River Aqueduct hydro projects—George R. Rich, partner, Charles T. Main, Inc., of Boston, pointed to them as examples of multipurpose developments to combine water supply for a very large city with profitable generation of electric power by private utilities.

Speaking at a City Planning Division session, William Reid, President of the Hudson & Manhattan Railroad Co., urged that "officials in Albany (N. Y.), Trenton (N. J.), and Hartford (Conn.)" be impressed with the need for a regional mass-transportation system that would ignore state and city boundaries in carrying people "into and out of New York City quickly and at a fare they can afford to pay." He indicated that the construction of additional wonderful highways would not reduce congestion, because more and more cars are pouring into the city over the highway facilities, faster than such facilities can be built. "All the highways money can buy will not provide for proper fast mass-transportation," said Reid.

The New Jersey Turnpike was treated in every aspect from its economic feasibility down to the service facilities such as gas stations and restaurants. In between, papers were presented covering in detail such subjects as: design standards; construction schedules and problems; stabilization and foundation problems; Hackensack and Passaic River bridges; and design and selection of pavement. The authors of the papers included officials of the New Jersey Turnpike Authority and consulting engineers who were engaged on the work.

Regular purchase of U. S. Defense Bonds means personal security as well as a share in the national security.



Turning woods into pastures: that is what this International TD-14A and dozer is doing near Cedar Grove, Ind. Contractors Carol Stewart and Loren Murphy, Brookville, adopted a dive-dozing technique down the hill, to rid the 7½-acre tract of brambles, trees, and rocks. Ten working hours and $100 completed the transformation.

NEW! WORTHINGTON-RA
—built to help you

It had to be built! Today's tight schedules and rigid specifications demand a new, better paver that can do a high-speed job without sacrifice in quality.

And it had to be built by Worthington-Ransome! It took 40 years of Worthington-Ransome paver experience and the unmatched facilities of their integrated engineering staff to make possible this new paver.

● INSTANT, POSITIVE RESPONSE WITH SMOOTH, EFFORTLESS CONTROL. Transfer and discharge chutes, water valves, boom swing, bucket travel and controllable bucket discharge, all easily operated with hydraulic control levers conveniently placed for rapid action.

● ACCURATE, WEATHER-RESISTANT BATCH METERS are unaffected by differences of oil thickness. Timing devices for both drum compartments built into single housing. Field trials of 75,000 batches prove reliability of these worm-gear-driven meters.

● WORTHINGTON'S EXCLUSIVE HYDRAULICALLY CONTROLLED BOOM BUCKET. No split batches in the mixing drum. Hydraulic gate control permits splitting batches in bucket without interfering with mixing cycle. Bucket doors can be opened any distance required to regulate flow of concrete. Concrete can be spread across runways up to 25 ft wide while paver operates outside forms.

● RUGGED, RESPONSIVE BOOM-SWING MECHANISM. Mechanism is hydraulically controlled, piston operated, bull-wheel type. Hydraulic cushioning prevents bent booms. No worm gears to break.

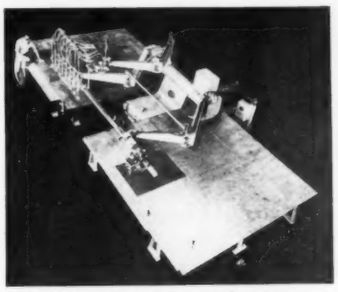
● FAST, POSITIVE BOOM RAISING AND LOWERING. Worm-drive mechanism fully enclosed and running in oil; operates only when booming up and booming down.

IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB

A Pantograph-Type Steel-Cutting Unit

The Airco No. 50 Travograph is a new addition to the line of gas cutting machines made by Air Reduction, 60 E. 42nd St., New York 17, N. Y. A heavy-duty pantograph-type machine, it will cut an unlimited variety of shapes from steel plates, slabs, billets, and forgings, the company says. It features all-welded heavy-gage-steel construction; rigid rail assembly, made of specially rolled tracks with machined surfaces to provide a smooth runway for the carriage; guide rollers in the carriage base; flame-hardened carriage wheels; precision-machined operating bar for easy movement of torch holders; and large-diameter ball bearings in the pantograph arm hinges and operating bar for accurate response to the movement of the tracer.

The Thym-o-trol controlled carriage drive motor is self-contained and provides stepless variations in carriage speeds from 2 to 168 inches per minute.



This Airco No. 50 Travograph, a heavy-duty pantograph-type gas cutting machine, will cut a variety of shapes from steel plates, slabs, billets, etc.

The carriage remote-control box can be mounted on the operating bar along with remote controls for the gas distribution system and other auxiliary equipment. This provides a complete "operator's station", Airco says.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 202.

New Cleaner Checks Engine Overheating

A radiator and water cleaner to protect automotive engines against overheating due to faulty cooling systems has been introduced by Fram Corp., Providence 16, R. I. It functions as follows: A controlled amount of water flows continuously from the cooling system and enters the cleaner. Water contacts the softening and inhibiting chemicals in a replaceable cartridge, and passes through a filtering medium where solids are removed. Filtered, softened water containing soluble inhibitor re-enters the cooling system and circulates throughout, with the result that the coolant is free of particles, and cannot cause scale deposits, rust, or corrosion, Fram claims. The action of the cleaner is said to be harmless to antifreeze and other radiator chemicals.

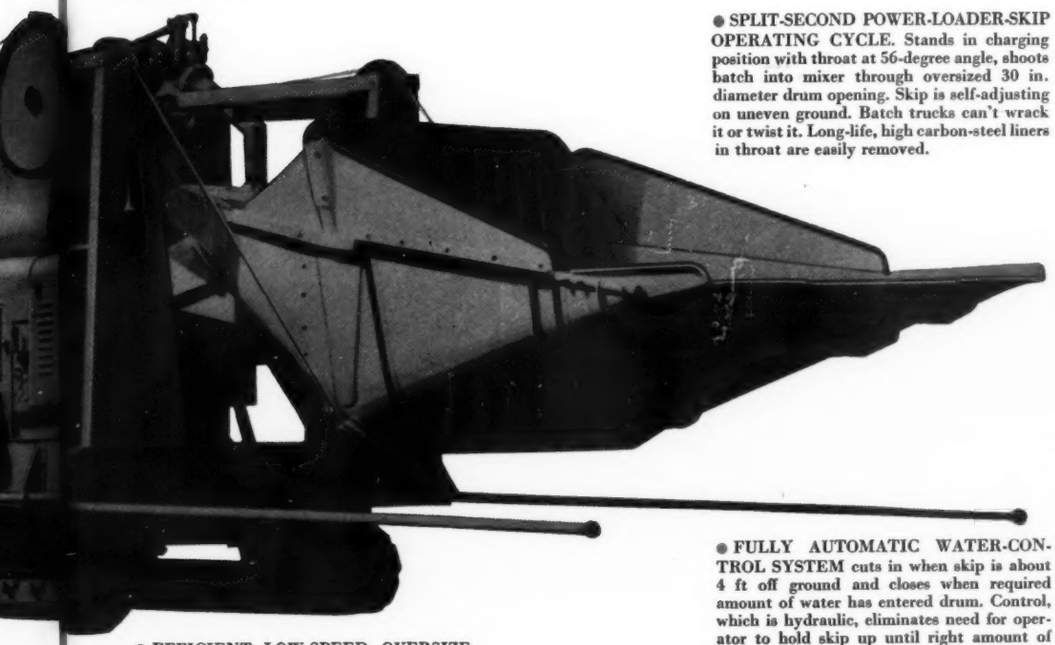
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 181.

I-RANSOME PAVER

set paving records

Check these features of this newest paver and see for yourself.

- Power loader skip takes only 6½ seconds from ground to discharge position of 56° on low slope
- Transfer from first compartment to second compartment approximately 6½ seconds, depending upon concrete consistency
- Discharge into boom bucket approximately 6½ seconds, depending on concrete consistency
- Boom bucket travel speed—256 ft per minute
- Hydraulically-controlled boom swing of 171°
- Can swing and spread simultaneously



● SPLIT-SECOND POWER-LOADER-SKIP OPERATING CYCLE. Stands in charging position with throat at 56-degree angle, shoots batch into mixer through oversized 30 in. diameter drum opening. Skip is self-adjusting on uneven ground. Batch trucks can't wrack it or twist it. Long-life, high carbon-steel liners in throat are easily removed.

● FULLY AUTOMATIC WATER-CONTROL SYSTEM cuts in when skip is about 4 ft off ground and closes when required amount of water has entered drum. Control, which is hydraulic, eliminates need for operator to hold skip up until right amount of water is discharged by using an adjustable automatic water cut-off delaying action.

● EFFICIENT, LOW-SPEED, OVERSIZE DIESEL. Cummins HBID-600. Engine speed only 1300 RPM. Experience has shown that this kind of power unit performs better, lasts longer, and costs less to run. Main power take-off speed-reduction unit has cut tooth, helical gears; sealed, self-aligning anti-friction bearings. Sealed, triple-width roller-chain coupling between speed-reduction unit and countershaft.

Get the complete story of this new Worthington-Ransome WP Paver through your Worthington Blue Brute Distributor or by writing direct to Worthington Pump and Machinery Corporation, Construction Equipment Division, Dunellen, N. J.

WORTHINGTON

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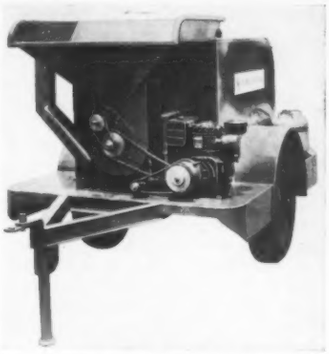
R.1.3



This is the Moto-Patcher for maintenance work. It delivers up to 10 tons of mixed patch material an hour.

Mobile Patch Unit

A mobile patching unit for rear mounting on trucks is manufactured by Hetherington & Berner, Inc., 731 Kentucky Ave., Indianapolis 7, Ind. The Moto-Patcher consists of a feed hopper, mixing conveyor, bitumen tank, and a tank heater using either bottled gas or kerosene. It delivers up to 10 tons of freshly mixed material per hour, the company claims. Aggregate may either be shoveled into the hopper, or fed into the hopper by a small elevator, which is optional equipment.

The 400-gallon tank is said to hold an adequate supply of bitumen for uninterrupted production, making frequent stops unnecessary. The bitumen may be circulated when the machine is not mixing. Front and rear connections are provided for hand spraying. The mixed material is deposited on a pan of convenient height for shoveling, or it can be dropped directly onto the road surface.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 131.

Folder on Striping Guns

A 6-page folder on two air-operated striping guns for center-line and zone marking has been released by Kelly-Creswell Co., Xenia, Ohio. It presents the AGA-593 and the AGA-598 guns which have replaced the WV-593 and WV-598 guns respectively, (Service parts for the WV-type guns will still be available) and it tells what attachments are necessary when an AGA gun is being ordered as a replacement for a WV. Both of these guns are designed by De Vilbiss and manufactured exclusively for Kelly-Creswell Co.

The catalog points out that the high-speed AGA guns maintain uniform film thickness and an accurate pattern throughout long production runs; and that they handle a wide range of marking material, including new premix-reflectorized material. Width of line can be varied from 3 to 6 inches. The folder also describes Kelly-Creswell air curtains.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 189.

Two Trailmobile Managers

The appointment of two new managers is announced by Trailmobile, Inc., Cincinnati, Ohio, manufacturer of truck-trailers. John J. Peterson is Eastern Division Manager with headquarters in New York City; and C. W. Griffin is Manager of the company's new factory branch in Birmingham, Ala.

Mr. Peterson joined Trailmobile in 1945, and in 1947 was promoted to Branch Manager in Buffalo. Mr. Griffin, who joined the company in 1949, has served in Birmingham since March, 1950, when Trailmobile formed a sub-branch there. This sub-branch is now raised to full branch status under Mr. Griffin's management..

New Membrane Liner For Canals, Ditches

A lining material designed to control seepage and erosion in ditches and canals is announced by Owens-Corning Fiberglas Corp., Nicholas Bldg., Toledo 1, Ohio. The Fiberglas-reinforced prefabricated asphaltic membrane was developed in cooperation with the Bureau of Reclamation. It can be installed on the bottoms and sides of irrigation and drainage canals, lateral ditches, and stock ponds; it can be applied any time during the year and can be stored indefinitely, the company says. Two unskilled laborers with hand tools can do the work; a crew of four to six can apply 200 to 300 square yards an hour under normal conditions, according to the manufacturer.

Installation follows standard practice. The canal or ditch is over-excavated by dragline or other excavator to a depth of one foot—or 2 feet if conditions are severe and greater cover depth is required. The extra depth is, of course, for an earth or gravel fill over the liner to protect it from livestock and weather. Sideslopes should be flattened to keep cover soil in place. The soil removed is piled on top of the canal bank so that it will be ready when needed as replacement for cover. The tops of the sidewalls are shaped to allow for a liner anchor. Since a smooth surface is required for a tight, uniform installation, the subgrade should be dragged and lightly rolled.

Liner strips 3 feet wide x 36 feet long can be installed longitudinally or transversely; on a fairly large canal, longitudinal laying reduces cutting. A rapid-setting cutback asphalt seals strip joints. Overlap should be at least 3 inches, the company says, and a sprinkling can with its head removed can be used to distribute the asphalt. Wire staples, up to 8 inches for soft ground, anchor the lining to the ground at intervals of 2 feet in the overlap, to prevent the liner from slipping before the backfill is in place. Excavated soil then is placed over the canal liner. If the canal is subject to erosion, a gravel blanket, 4 inches to 1 foot deep, may be placed over the soil.

Owens-Corning reports that the Fiberglas canal liner has been tested in Denver, Colo., Altus, Okla., Notus and Post Falls, Idaho, and Leandro, Calif. It states that the liner has a long life, is impervious to moisture and to soil acids, is strong enough to resist tearing and puncturing, and is flexible enough to conform to the contour of the ground surface.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 155.

Fiberglas irrigation-canal liner is laid transversely, and backfill is placed to help resist damage by livestock and weather. The liner is designed to control seepage and erosion in canals and ditches.

Steel Institute Elects

The American Institute of Steel Construction, Inc., New York, N. Y., elected officers last October at the close of its Annual Convention at White Sulphur Springs, W. Va. R. D. Wood, Chairman of the Board of Mississippi Valley Structural Steel Co., Chicago, was re-elected President. L. Abbett Post was re-elected Executive Vice President.

First Vice President is John E. Jackson, Pittsburgh-Des Moines Steel Co., Pittsburgh. Second Vice President is Earle V. Grover, Apex Steel Corp., Ltd., Los Angeles. Treasurer is James M. Straub, Fort Pitt Bridge Works, Pittsburgh. Secretary is M. Harvey Smedley, New York City.

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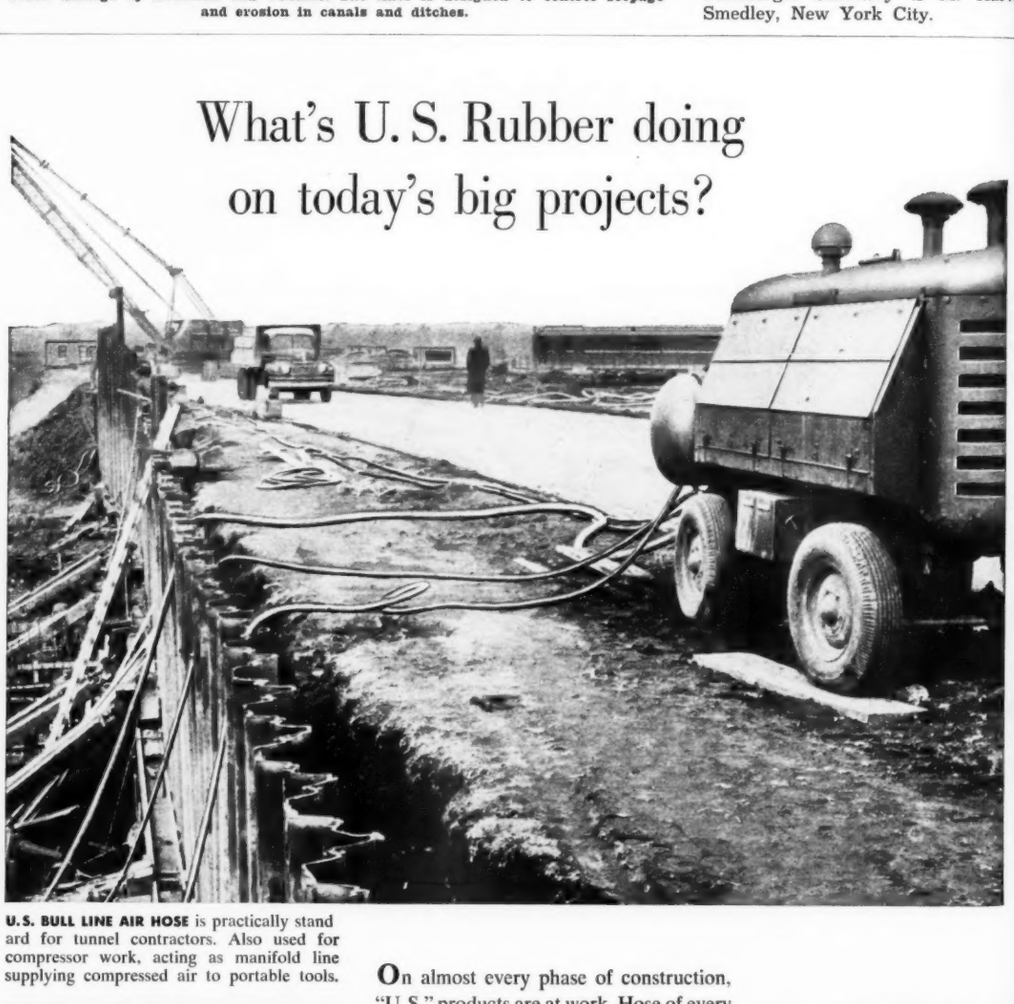
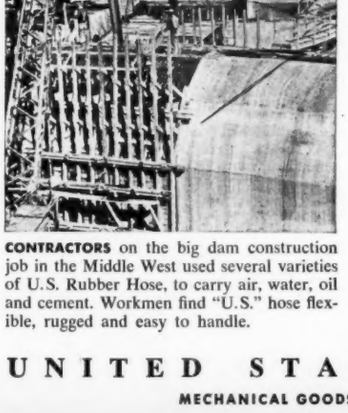
*Clip this coupon to your letterhead. FREE to Engineers and Contractors, only. Regular price to all others, $1.50.

What's U. S. Rubber doing on today's big projects?



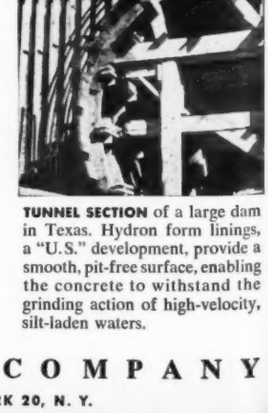
U.S. BULL LINE AIR HOSE is practically standard for tunnel contractors. Also used for compressor work, acting as manifold line supplying compressed air to portable tools.



CONTRACTORS on the big dam construction job in the Middle West used several varieties of U.S. Rubber Hose, to carry air, water, oil and cement. Workmen find "U.S." hose flexible, rugged and easy to handle.

On almost every phase of construction, "U.S." products are at work. Hose of every type, in dozens of specifications, packings from the most complete line in industry, Hydron absorptive form linings, "U.S." flexible form strips, conveyor belts large and small, transmission and elevator belts, and the remarkable U.S. Rainbow V-Belts with the unique Equa-Tensil Cord Section ...these are some of the many "U.S." items contractors rely on to keep the job moving faster. For further information, write to address below.

PRODUCTS OF U.S.RUBBER SERVING THROUGH SCIENCE



TUNNEL SECTION of a large dam in Texas. Hydron form linings, a "U.S." development, provide a smooth, pit-free surface, enabling the concrete to withstand the grinding action of high-velocity, silt-laden waters.

UNITED STATES RUBBER COMPANY
MECHANICAL GOODS DIVISION • ROCKEFELLER CENTER, NEW YORK 20, N. Y.

AASHO Delegates See Steel Needs Critical

aterials Shortage, Stop-Gap Maintenance Methods, Safety, And Public Relations Highlight Meeting

By MICHAEL A. SPRONCK
Associate Editor

THE impact of the current defense obilization program on our roads was e principal concern of some 1,000 legates to the 37th Annual Meeting the American Association of State ghway Officials, held in Omaha, br., October 23 to 26.

In his keynote address, Thomas H. acDonald, Commissioner of the U. S. reau of Public Roads, pointed out at long-range experience dictates a d reconstruction program based on 12-year average pavement life. But e rate of rehabilitation of the high- y plant for the past ten years has eraged far less than this figure, until e now have an accumulated deficien- of over 74,000 miles. This figure is creasing each year by 5,000 to 6,000 iles, and current steel shortages are ding to the delay, to the tune of 680 ojects at present. Though failure to mplete Federal-Aid projects will cut ederal expenditures for the calendar ear, it will up state and local main- nance costs appreciably—the direct ss to the public is obvious, he said.

Mr. MacDonald went on to defend e BPR's estimate of road-steel needs criticized in some quarters because exceeds the pattern of previous ars. Urban road problems are re- ponsible, he said. The total cost of ederal Aid for urban highways has creased tremendously in the past o years. This reflects itself immedi- ely in the demand for steel, since penditures for structures on urban ork are double those for primary ads and triple those for secondary ads on a unit-dollar basis.

The Commissioner also pointed out direct relationship between highways d the production and distribution of eel. Using one of the major steel oducers as an example, he reported at its shipments by highway have creased more than 300 per cent in e past 4 years, while rail shipments e up only a fraction of this figure. his, he said, emphasizes the need of ll defense industries for adequate ads.

Washington Outlook

Legislators in the nation's capital e apparently aware of the critical eed for steel to improve highways, ut it is doubtful that much can or ill be done about it in the near future. he Hon. Thomas C. Hennings, Jr., ember of the Senate Committee on oads, cited 5-year figures of increased se of the nation's roads: 60 per cent ore vehicles, 80 per cent more trucks, nd 105 per cent more ton-mileage etween 1945 and 1950. It may soon e necessary, he said, to choose only e projects which are of the utmost portance, no matter in what state ey lie, since there just isn't enough eel to go around.

Delos C. Rentzell, Undersecretary of Commerce for Transportation, was a ttle more hopeful. He assured the AASHO group that they *would get* all e steel allotted for highways in 1952. e also reported that things look ighter for late '52. By the fourth uarter of 1952 the major plant ex- ansion will be met, he said, thus educing the demand for structural eel. Highway allotments will be in- creased accordingly. He urged high- way men to assist, meanwhile, in the scrap drive. With some plants holding as little as a 3½-day supply, scrap needs will be urgent in the next 6 months. Mr. Rentzell also reported that Washington is in full accord with the continuance of truck load limits by the various states. "Never have they been more important for the preservation of our highways than today", he said.

More About Steel

Highlight of the Construction Committee sessions was a report on steel allocation procedures by A. C. Clark, BPR Deputy Commissioner in Charge of Construction and Maintenance. He explained that there are now some 30 to 35 claimant agencies through which steel is allocated under the Controlled Materials Plan. The BPR is one of these, representing all claims for highway needs. Under the present program, highways of all types are to get 1 per cent of the nation's supply. This amounts to about 200,000 tons for the first quarter of '52, but the total is further limited by subcontrols on the type of steel (shape, plates, etc.). Even this figure, though, does not necessarily represent the actual amount highways will get—for two reasons. One is that the Bureau must temporarily hold 15 per cent in reserve, and the other reason is expected downgradings in allocations. For example, first-quarter allotments announced August 2, 1951, were 75,000 tons of structural-steel shapes and 18,500 tons of structural plates for highway use. The allocation for these specific types has now been reduced to 50,000 and 15,000 tons, respectively. The BPR is trying to have the allotments of the first and succeeding quarters increased, in view of the large number of essential high-

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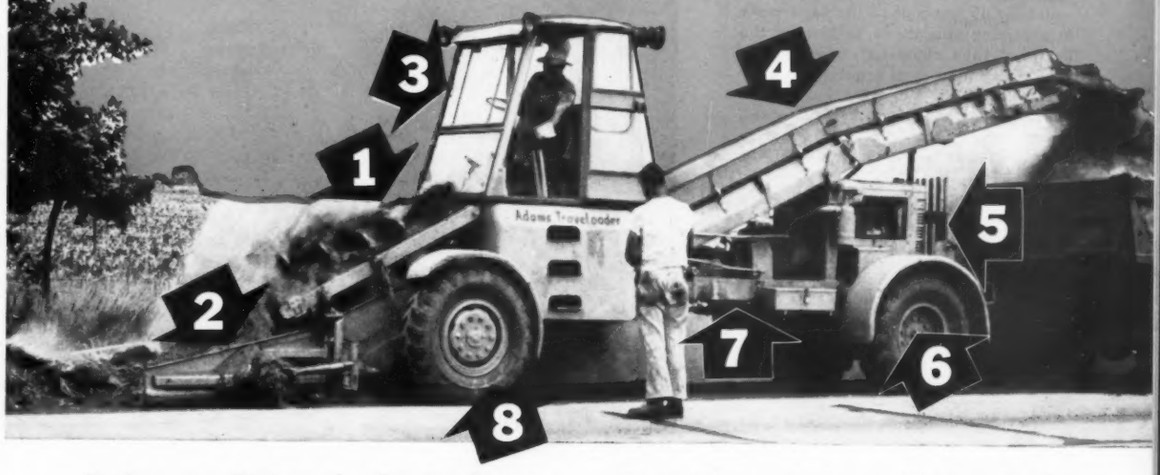
Mr. Highway Official or Contractor—
The New Adams TraveLoader

offers faster, easier operation for more pay loads per day—stronger construction and simpler design for longer life and lower upkeep cost



Performance Features for Greater Output

1. **High-Speed, Full-Floating Feeder**—Delivers a continuous stream of any kind of windrowed material to trucks—and does it at a faster rate than any other machines.
2. **Adjustable Gathering Molds** — Easily adjusted to width of windrow assuring maximum flow of material to feeder with least friction and loss of power.
3. **Centrally-Located Cab**—Located high—up out of the dust area—to give operator full vision in all directions, at all times—working or traveling.
4. **Adjustable Conveyor**—Raises and lowers to accommodate trucks of all sizes—provides better distribution of material in trucks—results in bigger loads—with less dust.

Plus—More working speeds and high transport speed.

Design Features for Longer Life, Easy Servicing

5. **Heavy-Duty, Industrial-Type Engine** — Built for long, dependable, low-cost operation.
6. **"No-Spin" Rear Axle** — Heavy-duty with locked differential—applies constant tractive power to both driving wheels for positive drive.
7. **All-Welded, Box-Type Frame**—Continuous box-type construction, from front to rear, insures exceptional strength and rigidity for long, trouble-free service.
8. **Large Tires**—Front and rear. Afford good flotation and traction plus ample carrying capacity.

Plus—Unit construction. All operating units—engine, transmissions, clutches, drives, hydraulic pumps, etc. —readily accessible for fast, easy, low-cost servicing.

Motor Graders TraveLoaders Pull-Type Graders

Adams

AASHO Delegates See Steel Needs Critical

(Continued from preceding page)

way projects now under construction. Due to the lack of steel, over 100 incomplete projects in large cities alone are tying up traffic.

Currently this is the way the program works: the amount of steel allocated to highways, less the 15 per cent reserve, is given to the states by the BPR on a pro rata basis according to the total estimated needs of all the states. Then contractors for each of the jobs in the state must get a mill placement O. K. for the finished products. The state may obtain this itself only where the contract specifies that the materials will be purchased by the state for erection by the contractor. The rub so far has been the inability to get the mills to take orders for all of the steel allotted. In this case the BPR, in cooperation with the National Production Authority, will attempt to place the deficient orders in a mill. If final attempts are unsuccessful, the state loses this portion of its allotment. The hue and cry surrounds this issue, since there is no provision to regain this loss in future quarters. However, the NPA "assures" highway departments that this condition will not occur when CMP is "fully operative".

Among other points brought up at this session was a request that something be done to raise the minimum steel requirements allowed for self-certification. It was reported that jobs requiring 25 tons of steel or less account for 45 per cent of the paperwork in obtaining allocations, in spite of the fact that they represent only 3½ per cent of the total steel requirements for highways. This was previously requested by Commissioner MacDonald, but refused by the Defense Production Administrator. Another try will be made.

Equipment

At a meeting of maintenance and equipment men, H. A. Radzikowski, Chief of Maintenance of the Bureau, said that rollers, tractors, shovels, cranes, pavers, and graders now require priorities, along with snowplows, which may be *very* difficult to get. Grader and dozer blades and tractor treads will also be scarce. Highways, he said, are eighth on the priority list for this type of equipment; agriculture, petroleum, and the building-materials industry are among the top seven. It was also reported that highway and street signs may be difficult to get. They have been classified as a consumer Class B product—along with lipstick cases—and the manufacturers are reduced to 50 per cent of previous production.

In cloakroom conversations, highway men expressed two additional gripes: no difficulty getting foreign steel if you want to pay the price, and the remarkable uniformity of scrap bidding prices at highway junk sales in some areas.

Highway Rehabilitation

One of the most valuable discussions took place during a combined session of highway maintenance and design men. M. F. Johnson, Director of Maintenance for Kentucky, pointed out that pavement rehabilitation is the most urgent problem facing highway departments today. Our highway system is wearing out at a rate far in excess of replacement or reconditioning. Citing figures in a report to Congress in January, 1950, he said that only $1.7 billion worth of new highways were built in 1949, against a need for $41 billion worth to meet current standards. "Thus, if the 1949 rate were continued, and that is doubtful," he said, "in 1973 we would equal the needs of 1949 and have a highway system 24 years out of date."

Most of the delegates agreed that a closer liaison is needed between design and maintenance forces to assure building roads that can be economically maintained. The consensus was that there is little point in building a short "super-duper" highway surrounded by feeders that are difficult to ride on and costly to maintain. The answer to the problem seems to be the organization of more rough-planning divisions (now a part of the highway departments of some states) to view each new job as it comes up in relation to the entire section between two cities. Using estimates for a 10-year period, the division can then design the job so it will fit into what can be accomplished on the entire section at some future time. Proponents of this idea stated that the rough-planning division should be composed of design, construction, and maintenance personnel so that the bugs can be worked out beforehand.

W. H. Root, Iowa Maintenance Engineer, gave a report on the stop-gap procedure his state uses to meet the current rehabilitation crisis. Widening and resurfacing ordinarily averages about $72,000 per mile on Iowa roads, but the stop-gap measure costs only $15,300 per mile. The procedure is to patch where needed, resurface with 3 inches of hot-mix, and build shoulders up to the level of the wearing surface. Iowa's present program is for 1,000 miles, with some 500 miles under contract and 130 miles completed by this year. Mr. Root made no claim for this procedure as providing a complete and modern road, but, he said, "It is the first step in future widening and resurfacing at a cost we can now afford". It also gives the design division time to complete plans for relocation when this is necessary. He reported that the public is much impressed by the new smooth surfaces. In fact, increased speeds on these sections may be a safety problem until the widening is done, he said.

Rex M. Whitton, Missouri Chief Engineer, reported successful use of a low-penetration asphalt for undersealing concrete pavements to stop pumping. After a period of work with its own crews, the Department found it

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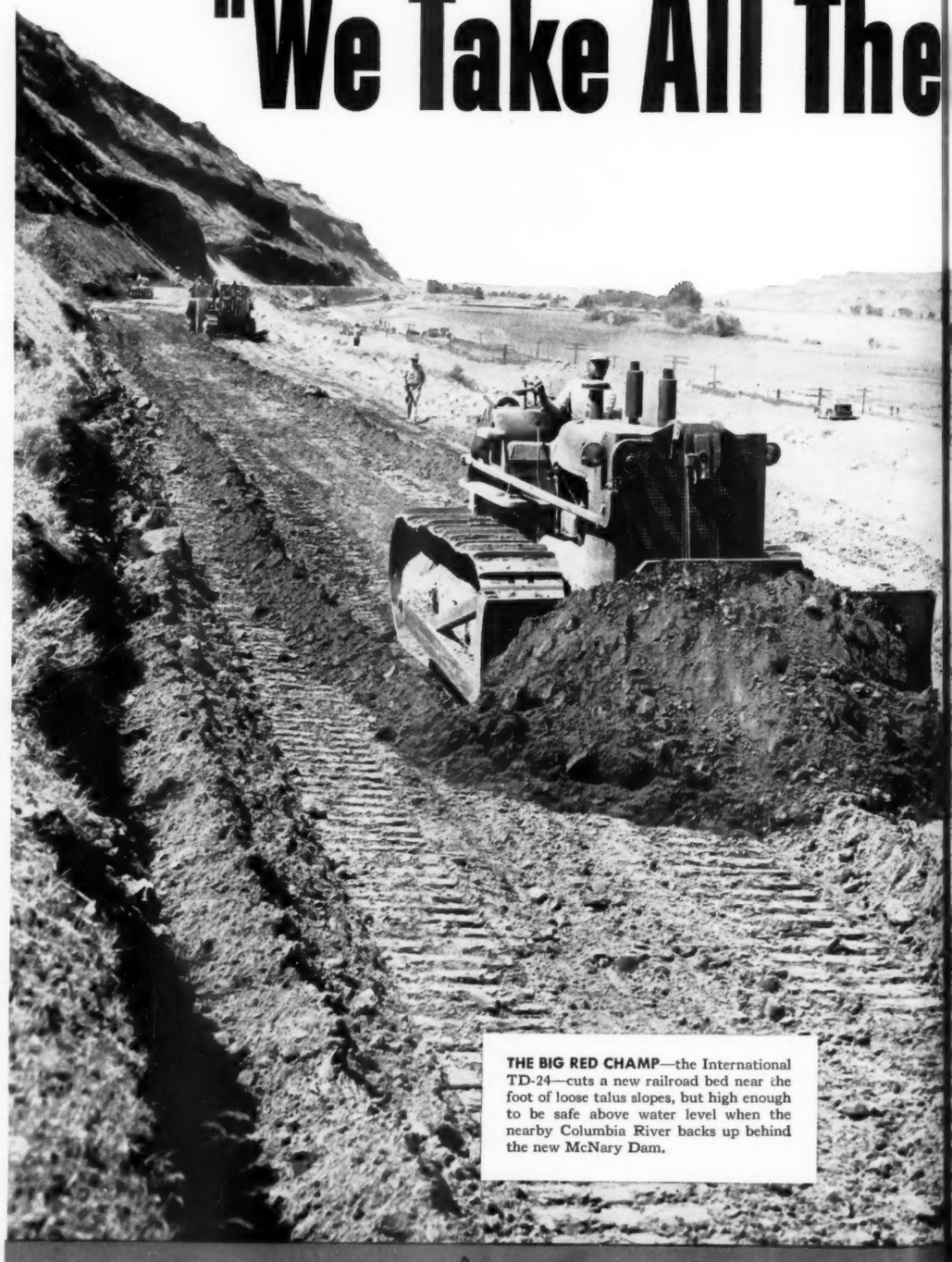
"We Take All The



THE BIG RED CHAMP—the International TD-24—cuts a new railroad bed near the foot of loose talus slopes, but high enough to be safe above water level when the nearby Columbia River backs up behind the new McNary Dam.

uld get contract bids at equivalent sts and is therefore letting the work. e subsealing is followed with patch-, and resurfacing when it is neces-ry.

Other discussions at this session ntered on the increased cost of intenance, and improvements in chanization to offset it; the effect various designs (median strips, pes, shoulders, and ditches) on intenance efforts; and the mainte-nce troubles caused by roadside sinesses. V. L. Ostrander, New York perintendent of Operation and Main-nance, termed the latter one of the hway department's most trouble-me problems. The growth of road-de eating places, gas stations, and en residential developments can have a serious effect on maintenance, he said. Pointing to changes in drain-age pattern which such a business causes, he said, "Water that formerly ran off the road into ditches may, after all the bulldozing work, run onto the highway. It also hinders snow-removal if we have to open the windrows to permit access to the road-sider's place of business or home." One state reported that it makes the businessman seeking roadside use take full responsibility for drainage across his frontage and for clearing snow windrows.

Safety and Other Problems

The progress report of the Maintenance Safety Committee, given by C. W. Ross, Illinois Maintenance Engineer, pointed up the serious danger faced by maintenance men on the road. Replies to a questionnaire developed by the committee disclosed 17,000 employee accidents requiring a doctor's attention, with 86 fatalities, at a cost of over $2,000,000 for the 40 (approximate) states reporting 1950 figures. Only 36 states have a safety program, 12 with a safety director; only 20 have a safety manual; only 17 have a nationally recognized system of reporting accidents; and only 11 have programs for training new employees in safety. Though the committee has made tentative recommendations for alleviating these conditions, a full report will not be available until January, 1952. Comments from the floor indicated that employment of a full-time safety engineer can do much to combat the problem—that the reduced insurance premiums, compensation claims, and lost time will easily pay his salary.

Following Mr. Radzikowski's progress report relative to pavement-marking costs, New Jersey asked that some uniform system be established to evaluate *all* maintenance costs. At the present time the use of linear miles, lane miles, and square yards of road surface makes a comparison of costs between states difficult.

C. L. Motl, Minnesota Maintenance Engineer, reported that tests in his state showed a 40 to 50 per cent decrease in the carrying capacity of subgrades during the spring thaw. These tests, he said, indicate that in many cases the roads must be strengthened or load limits changed during the thaw period, if pavements are to be preserved for year-round use.

Enlightened Truckers

Highway men were pleasantly surprised by the talk given by Milton Krammer, Assistant to the President of Associated Transport, Inc., one of the nation's largest trucking firms. He showed evidence of understanding the problem of maintaining the highway system and pointed to efforts his company and others are making to enlighten their employees. He asked that the motor-transport industry not be condemned because of violations by a few of its members. Truckers and highway men have an important job to do together, he said, in educating the general public to the need for adequate highways. Commenting on Mr. Krammer's talk, a delegate from Minnesota reported that monthly meetings between highway department men and trucking concerns have been very successful.

Law, Salaries, Radio

"The highway engineering profession has moved faster in meeting the needs of adequate design than the legal profession has moved in dealing with the obstacles brought about by such design", according to L. R. Morony, Director of the Laws Division of the Automotive Safety Foundation. He explained that engineers must convince highway-department legal advisers of the necessity of new designs if they, in turn, are to convince judges and juries when legal action is brought against the state.

The Joint Committee (Highway Research Board and AASHO) on Maintenance Personnel issued a progress report on personnel policies, and on average, maximum, and minimum salaries. It showed definite increases in salaries and fringe benefits, especially for the lower brackets. D. N. Stewart, Maintenance Engineer of Colorado, remarked that it was probably unfortunate that some of the states were losing their excellent retirement plans to less-rewarding social-security programs through acts of the state legislatures. As reflected in the discussion, unions did not seem to offer a problem to highway men. Most reports to the committee indicated that unions were O. K. and had even won the men raises from the state legislature where the department had failed.

A detailed progress report by Mr. Radzikowski indicated that 20 states, 46 counties, and 8 municipalities now use radio for operation on 216,608 miles of public roads.

Construction

Though steel allocation was the prime subject at the meeting of the Committee on Construction, other interesting topics were also taken up in round-table discussions.

Asked if the quality of construction inspection was deteriorating, many delegates said *yes*. Opinion was that with

(Continued on next page)

TOUGH JOBS"

One man and his Big Red TD-24 handle hardest assignments for western contractor

Out on the big Union Pacific relocation job north of the McNary Dam site, Cardon & Cox—subcontracting for Utah Construction Co.—have an International TD-24 shuttling back and forth from one end of their section of the project to the other, doing the hardest jobs wherever they may be.

TD-24 operator Wilbur Strootman says, "We take all the tough assignments, and do them faster and better than any other tractor on the job. This TD-24 is the best tractor I've ever been on. I really go for it."

Here are five big reasons why—five advantages that make the Big Red TD-24 the work champ of the world:

TD-24 Power—148 maximum drawbar horsepower, more than any other crawler on the market.

TD-24 Speed—8 forward speeds, 8 reverse. Moves loads faster, gets back faster for a faster work cycle.

TD-24 Operation—Synchromesh transmission, you shift "on-the-go." And you go up or down one speed without declutching.

TD-24 Steering—Fingertip steering for pivot turns, feathered turns, turns with power on both tracks.

TD-24 Starting—Quick push-button starting in any weather.

Want to know more? Ask a friend who owns a TD-24. And ask your International Industrial Distributor both about the TD-24 and about his fast field service and complete shop facilities. You'll be a TD-24 man from then on in!

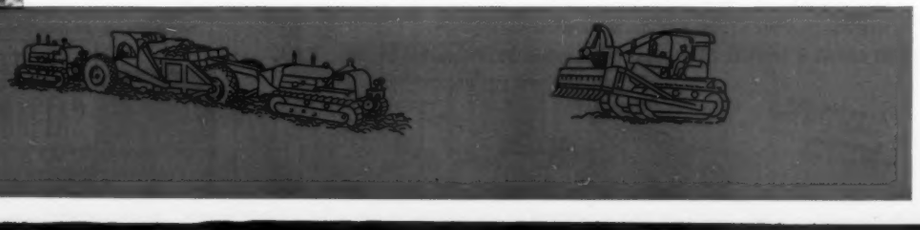
INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

INTERNATIONAL HARVESTER

INTERNATIONAL

POWER THAT PAYS

INTERNATIONAL POWER PAYS OFF ON THIS BIG RAILROAD RELOCATION PROJECT



AASHO Delegates See Steel Needs Critical

(*Continued from preceding page*)

the current shortage of engineers, it is difficult to get capable men—and even more difficult to keep them once they have had a few years' experience and are offered higher salaries outside the department. Talking about the use of prequalification to favor awards to firms who will push the work rather than those who tend to delay, many said it was a good idea, but in fairness to contractors it should be employed before proposals and not after bids are opened. Others reported that their states would not allow it; low bid only, they said.

States in the snow belt reported that scaling and deterioration of portland-cement-concrete pavements is a problem, but that it can in many cases be eliminated by the use of air-entraining agents. Two states reported trial use of an oil coating on concrete surfaces to offset the action of ice-removal chlorides. There are no definite conclusions on this test yet. Another topic heatedly discussed: is it necessary to compact soils in cuts? Most delegates felt that it depends on the character of the soil and drainage conditions; no conclusion was reached.

Highway Public Relations

A proposal for a nation-wide training course for right-of-way personnel, to be conducted by correspondence and to include periodic examinations, was taken under consideration by the AASHO Committee on Right-of-Way. The discussion emphasized the inconsistency of a highway department having a public relations division while it permits untrained right-of-way personnel to make daily contacts with the public.

The Committee on Public Relations heard talks on work being done in the various states to engender public good will. Vear Mann, Kentucky Director of Public Information, reported that his Department's program and expenditures to attract tourist trade—and thereby increase gasoline revenues—have proved entirely successful and have the whole-hearted support of people in the state.

The PR group also formulated a plan for a nation-wide exchange of ideas, starting off with an interim meeting in the spring and a questionnaire on public-relations work.

Designs, Bridges, Loads

A looseleaf handbook for design engineers and draftsmen is being compiled by the AASHO Committee on Design. It will contain design charts, tables, explanations, standards, etc., covering classifications for designs, curve designs, cross-section designs, and grade and sight distance. Work on the handbook was continued during committee sessions.

The Bridge and Structures Committee meanwhile devoted its attention to movable-bridge specifications, last revised in 1939. It is also seeking Federal aid for bridge alterations required for greater clearances over navigable channels.

The Committee on Highway Transport spent much of its time on proposed policy changes which would encourage longer vehicle wheelbases and increased numbers of axles to improve load distribution. Progressive increases in gross vehicle weight and payload would be permitted with each additional axle and/or increase in axle spacing.

Two very interesting papers were delivered by William E. Willey, Engineer of Economics and Statistics of the Arizona Highway Department. The first covered methods and conclusions of an engineering analysis made by Arizona to determine when and where special truck lanes were warranted on grades. The second outlined the Arizona method of measuring highway needs by sufficiency ratings. By rating road sections acording to their condition, safety, and serviceability, department engineers and administrators are able to view the over-all needs on an unbiased state-wide basis. No cure-all, according to Mr. Willey, it does offer a guide to economical and efficient expenditure of highway funds.

Resolutions and New Officers

Resolutions taken at the AASHO meeting this year struck at the critical problems that are hamstringing highway men in their efforts to rehabilitate and reconstruct the nation's roads. World War II restrictions on highway work, present materials shortages, and increasing traffic have created a chaotic condition, the AASHO said. Therefore, Resolution 1 requested that the essentiality of highways be given proper recognition by increasing the allotment of steel for highway purposes to at least 2 per cent of the total national production; that the classification of highway equipment be raised to a proper relationship of importance; and that highways be reclassified as an industrial facility. Such a reclassification would permit self-certification of many more small jobs and thereby reduce paperwork.

Resolution 2 opposed granting common carriers the authority to haul explosives over public highways.

Number 3 recommended that the AASHO further coordinate water-resources projects and highway-development

(*Concluded on next page*)

FLINK SPREADERS

So Good Uncle Sam Wants First Call . . . .

Yet Immediate Orders Can Still Be Filled

Model SS

New improved pull type Spreader for sand, cinders and all other granular materials used for ice or dust control and sealcoating. Large hopper for easier charging. The demand for Model SS Spreaders for military airport use has limited the civilian availability; however, we will continue to fill orders as received as long as material holds out.

Thousands of Flink "Power-matic" hydraulic drive, tail gate spreaders are currently in use for ice control, dust control and road building and maintenance. Does not limit the use of the truck for spreading alone. Cab control. Write for literature and name of distributor near you.

THE Flink CO. STREATOR ILLINOIS Department 700

1 of 10 Reasons Why UNIT is a Better Machine

The UNIT 1020 — ¾ Yard Shovel furnishes economical and dependable service on every digging operation. Constructed to operate as a complete unit, its fewer working parts reduce replacement, operating, and maintenance costs.

Drop-forged parts are used throughout in the construction of UNIT equipment. Forgings are remarkably free of concealed defects and have fatigue-resistant qualities which assure uniform toughness in these parts. The front legs of the "A" frame and the end connections are one-piece drop-forgings, built to withstand the great strains imposed in digging or lifting operations. Forging also imparts a flawless grain structure to steel, thus giving it greater strength to accommodate enormous compressive stresses. For this reason, ALL spur and bevel gears, boom-hoist worm, power take-off drive worm, turntable hook-rollers, crawler-rollers, and many other equally important parts, are drop-forgings on UNIT Cranes and Excavators.

7th of a series of 10 ads describing outstanding UNIT features.

UNIT CRANE & SHOVEL CORP., 6309 W. Burnham St., Milwaukee 14, Wis., U.S.A.

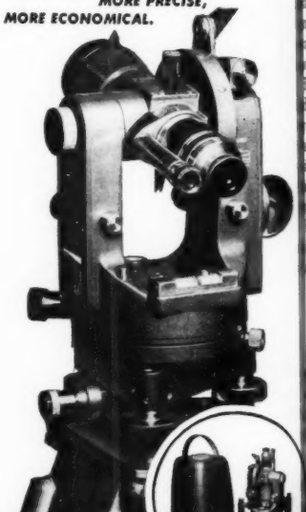
Crawler and Mobile models — ½ and ¾ Yd. Excavators. Cranes up to 20 tons capacity.

UNIT

SHOVELS • DRAGLINES • CLAMSHELLS • CRANES • TRENCHOES • MAGNETS

The FILOTECNICA 6" OPTICAL TRANSIT-THEODOLITE

The newest and most modern instrument for surveyors and engineers. Its special innovations combine to make instrument operation **MORE RAPID, MORE PRECISE, MORE ECONOMICAL.**



Special features include:

OPTICAL PLUMMET—eliminates plumb bob

OPTICAL READING SYSTEM—vertical and horizontal readings taken at a glance to 6" thru microscope eyepiece next to telescope.

REPEATING LEVER—speeds repetitions, prevents errors.

FULL "BEHIND INSTRUMENT" OPERATION—all operations controlled from operator's position behind instrument.

F/S Model 4150 R weighs only 9 lbs. 14 oz.—stands 10" high. Complete with adjustable-leg tripod and aluminum alloy carrying case, $650.

Full service and repair facilities available.

TRANS-GLOBAL COMPANY
1480 Broadway, New York 18, N. Y.
AMERICAN DISTRIBUTORS FOR—

FILOTECNICA SALMOIRAGHI S.P.A. Milan

ent work, and take steps to secure lation authorizing a nation-wide uation of the impact of the one the other. The evaluation should ude data on the over-all effect of zontal and vertical navigation rance requirements for highway ge, dam, reservoir construction.

ther resolutions related to the scrap e, appreciation for the service of sident J. A. Anderson, and thanks Nebraskans for their hospitality.

ew officers elected were: B. D. amy (New York) President; C. M. gler (Michigan) Vice President; G. H. Henderson, Treasurer. New on vice presidents are Frank Mer- (New Hampshire) Region I; W. Pruett (Alabama) Region II; T. J. er (Ohio) Region III; and Mark rous (Colorado) Region IV. The owing were elected to the Executive mmittee: D. C. Greer (Texas), P. Kitfield (Massachusetts), G. T. Mc- (California), R. F. Smock (Penn- ania), and F. R. White (Iowa).

ther official business included the entation of 186 Awards of Merit nen with 25 years of service. J. A. erson, Association President, sug- ed in his morning address that a eran's Club might be formed for bers with 40 or more years of ice.

Heat-Resistant Paint

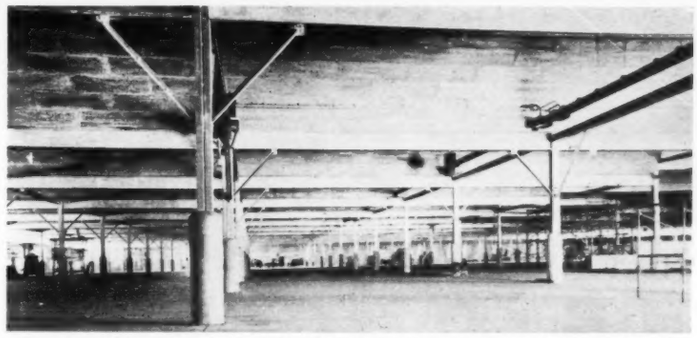
n aluminum paint with extra-high t resistance is announced by Speco, 7308 Associate Ave., Cleveland 9, o. According to the manufacturer, t-Rem H-170 can withstand tem- atures up to 1,700 degrees F, while dard Heat-Rem serves in the tem- ature range of 1,000 to 1,500 de- es F.

-170 utilizes a silicone base and is to fuse with surface metal. It will in 30 minutes and it forms a bright, tic finish resistant to moisture, cor- on, mild acids, alkalis, and indus- l fumes, Speco says. It is packaged uart, gallon, and 5-gallon cans.

urther information may be secured m the company. Or use the Request d at page 16. Circle No. 134.

Prefabbed Building

n addition to its line of Quonset fabricated buildings, which provides tructure suitable for most industrial commercial requirements without g hot-rolled structural shapes, is



The Quonset Long-Span is framed with Stran-Steel members made from cold-formed strip steel. Interior columns are 40 feet apart along the building's depth and 35½ feet across its width. Clearance under trusses or struts may be 15 or 18 feet.

announced by Stran-Steel Division, Great Lakes Steel Corp., Ecorse, Mich. The Quonset Long-Span is framed with Stran-Steel members made from cold-formed strip steel, and is available in a range of widths and lengths. Interior columns are 40 feet apart along the building's depth and 35 feet 6 inches apart across its width.

Clearance under trusses and struts may be either 15 or 18 feet. The roof arch provides unobstructed dome height between girders and struts of either 25 or 28 feet above the floor. This height generally is ample for equipment such as boilers, furnaces, or dry kilns, the company says. The building has straight sidewalls, and may be ordered with standard doors or equipped in the field with overhead or special doors.

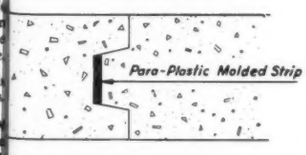
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 111.

Brown & Root Reorganizes

C. J. Rollo has been promoted to Vice President of Brown & Root, Inc., Houston, Texas, following the death of W. A. Woolsey, Executive Vice President, last September. Mr. Rollo, who was Manager of the company's industrial building construction program, will assume some of the duties of the late Mr. Woolsey, while others will be distributed among different officers. Mr. Rollo has been with Brown & Root since 1940 and has been project manager and manager of various construction jobs for the firm.

Para-Plastic...

MOLDED STRIP OR KEYED CONSTRUCTION JOINTS



aling keyed construction joints with emolded Para-Plastic Strips assures low cost, easily made watertight seal. oncrete poured against the Para-Plas- Strip, will, after setting, form a atertight bond with the strip. Strips ade in sizes from 1/4" to 1" thick and to 12" wide in standard lengths of 5 t. Economical, easy to handle, Pre- olded Para-Plastic is widely used on ery type of engineered structures.

Write today for complete details and catalog.

SERVICISED PRODUCTS CORP.
6051 W. 65th ST., CHICAGO 38, ILL.

Operators Agree...
there's NO WINTER LAYOFF for a
LULL Shoveloader

EXTRA LIFTING STRENGTH
Lull Shoveloaders are equipped with lifting arms of rugged bridge-like construction. They are designed to give maximum lifting strength without bulkiness and to eliminate twisting or swaying even under maximum loads.

SNOW IS NO PROBLEM . . .
for a LULL SHOVELOADER

You'll find Shoveloaders working on city streets, at airports, in the country, and around industrial plants, pushing . . . piling . . . plowing . . . or loading snow with their usual cost cutting efficiency.

Lull Shoveloaders are designed with more weight to the rear of tractor for easier handling and greater traction . . . both mighty important factors in winter operation. Power down crowd instantly controlled by operator permits a quick break through of hardest packed, heavy wet or even deep crusted snow. Ideal for clearing the way for heavy traffic or other operations. These are but a few of many reasons more and more experienced operators agree . . . there's NO WINTER LAYOFF for Lull Shoveloaders.

LONG FORWARD REACH permits Lull Shoveloader to fully load truck bodies from the rear, using only one lane of traffic and eliminating extra time consuming maneuvering.

EIGHT VALUE-PACKED MODELS
Eight models with a wide variety of interchangeable attachments make Lull Shoveloaders the most versatile equipment you can own.

Get LULL SHOVELOADER FACTS today.
MAIL THIS COUPON NOW!

LULL Manufacturing Company
3612 East 44th Street Minneapolis 6, Minn.
Designers and Builders of
The Largest Line of Allied Equipment
for Industrial Wheel Type Tractors

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Address .....
City..... State.....

SHOVELOADERS • UNIVERSAL LOADERS • FLUID-DRIVEN SWEEPERS • LULLDOZERS • SHOULDER MAINTAINERS

Truck Proving Ground

If a truck gets through a full-scale test on International Harvester Co.'s proving ground at Phoenix, Ariz., there won't be much the matter with it.

The company recently completed a new 28-foot 7¾-mile paved test track, which loops irregularly in a 5-square-mile area. The proving ground itself, constructed as a part of I-H's test program for crawler tractors, was initiated in 1947. Consisting of 6½ square miles of desert land on the southern shelf of the Salt River Mountains, some 22 miles by road from Phoenix, the testing area undergoes temperatures covering a 100-degree range, so year-round conditions are assured. It includes the new paved track, a rough 4-mile dirt track, 11 miles of access roads, and a number of special test areas such as a "figure 8" and a series of steep grades, ranging from 20 to 60 per cent, for off-highway trucks.

International's truck test fleet is a cross section of various types, numbering generally between 25 and 30 and including some competitive makes. Endurance tests, engineering tests, production quality tests—all these are carried out with trucks loaded to capacity, over rough terrain including a number of high rocky hills. Arizona's notorious caliche and hard rock form the soil of the proving ground. High-altitude and cold-weather tests are run off in the 10,000-foot mountain ranges a few hours' drive to the north. Such detailed tests as cooling, braking, and acceleration take place on the 5,900-foot strip of "dead flat" 40-foot paving contained in the loop. Another test the company has established in this sandy, dusty area of the United States is an air-cleaner test.

Heavily laden International motor trucks mount a 9 per cent grade on the company's proving ground at Phoenix, Ariz. Tests are grueling on the 7¾-mile paved loop track.

Of special interest in International's proving ground is the pavement, which I-H engineers laid out and which is being watched with professional interest by state and Federal highway officials to see whether it fulfills its designers' intention that it should bear a load weight of 22,000 pounds per axle and afford speeds up to 90 miles an hour. Contrary to the usual procedure, the fill material was put in dry instead of being wet down and compacted, and dirt-moving scrapers which were working on its surface supplied pneumatic compaction.

Features of the proving ground are testing-program shops maintained on the spot, together with a staff of engineers, test drivers, servicemen, and clerks, all of whom keep the test results flowing. The motor-truck service shop is fully equipped.

International Harvester estimates that its truck-testing program totals more than 3,000,000 miles annually.

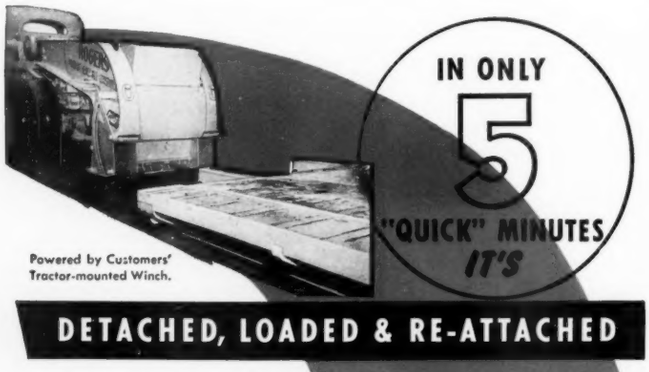
Consulting Firm for Turnpik

J. E. Greiner Co., Baltimore, Md., the consulting-engineer firm chosen by the Ohio Turnpike Commission as general consultant on the projected $300,000,000 toll turnpike across northern Ohio. The Commission signed a contract with Greiner in October. It also authorized State Highway Director T. J. Kauer to set up a Commission staff, to consist of a chief engineer, a legal staff, and specialists in various types of construction.

Booklet on Arc Welding

A pocket-sized guide to all forms of arc welding is available from Hobart Bros. Co. "Hobart Welding Electrode and Welders' Vest Pocket Guide" contains information on metals and types of electrodes, color marking for identification, types of joints, standard steel shapes, as well as advice on causes of common welding troubles and instructions for using all Hobart electrodes.

A free copy of the booklet, which contains an application card for further information and catalogs, may be obtained from Hobart Bros. Co., Box EW-161S, Troy, Ohio. Or use the Request Card that is bound in at page 10 Circle No. 250.



DETACHED, LOADED & RE-ATTACHED

Ready to GO!

ROGERS
POWER LIFT
DETACHABLE GOOSENECK
TRAILER
PATENTS PENDING

Frame is lowered to ground without need of blocking. Maximum height of 16" assures rapid, safe loading of equipment.

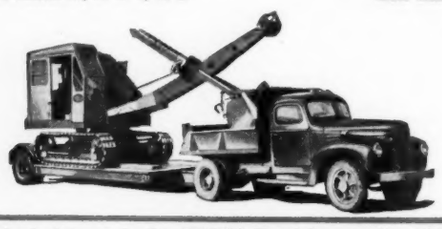
Complete Literature available upon request—Any Rogers Dealer will demonstrate its features right on your desk, with an OPERATING SCALE MODEL.

RAISES ITS DECK TO CLEAR HIGH BANKED CROSSINGS

STOOPS TO CLEAR LOW OVERHEAD OBSTRUCTIONS

CARRIES HEAVIER LOADS MORE PROFITABLY ON LARGER TIRES

DEVELOPED BY
The Trailer Pioneers
ROGERS BROS. CORP.
ALBION, PENNA.
108 Orchard St.
Export Office: 50 Church St., N. Y. 7, N. Y. Cable Address: "Broscites"

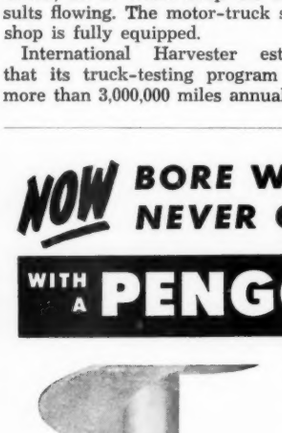


Also of timely interest is this ROGERS Tag-A-Long trailer which makes a dump truck serve as a tractor and effects sizable savings for contractors.

Cooper-Built
STEEL or ALUMINUM BUILDINGS for all purposes

Field Offices • Storage Sheds • Pump Houses • Machine Shops • etc.
QUICK DELIVERY
Write for Catalog
JOHN COOPER CO.
293 2nd Street Hackensack, N. J.

NOW BORE WHERE YOU NEVER COULD BEFORE
WITH A PENGO CUTTING HEAD
FOR CONTINUOUS HELIX-TYPE EARTH DRILLS AND POST HOLE AUGERS



1. Welds onto helix to replace conventional cutting device.

2. Twin helix design eliminates back thrust; bores true, clean holes in any soil.

3. Replaceable teeth are correctly angled for fast cutting with minimum power.

4. Live-action pilot bit won't pivot; penetrates ground you could never bore before!

All wearing parts replaceable on the job, and are interchangeable with the well known heavy duty PENGO Earth Auger parts of the same size.

Available in nine sizes, from 8" to 24" diameter.

ORDER NOW—*or write for free literature and prices*

PETERSEN ENGINEERING CO.
MANUFACTURERS
SANTA CLARA, CALIFORNIA

Pioneer's 54 x 24-inch triple-roll unit is designed for reduction crushing behind a 3042 or larger jaw crusher.

Triple-Roll Crusher

A 54 x 24-inch triple-roll crusher has been announced by Pioneer Engineering Works, 1515 Central Ave., Minneapolis 13, Minn. It is designed for reduction crushing behind a 3042, or larger, jaw crusher, and is available for either stationary or portable installations.

The stage of reduction varies from ½ to 2 inches when producing minimum sizes of products from 4 inches to ¼ inch minus, respectively. This means that when producing a 4-inch-minus product, pieces up to 9 x 9 inches can be fed to the crusher. When producing ¼-inch-minus material, pieces up to 2¼ x 2¼ inches can be fed. Nominal production will vary from approximately 35 tons an hour of ¼-inch minus, to 500 tons an hour of 4-inch minus, based on material weighing 2700 pound per cubic yard, the company says. Because of its high stage of reduction, the new triple roll permits greater opening of the jaw-crusher setting, thereby increasing over-all crusher output, Pioneer claims.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 161.

Engine-Water Filter

A water filter and purifier, designed for installation on trucks and road equipment to eliminate engine overheating, is available from Butler Engineering Co., 2612 Rousseau St., New Orleans 13. According to the company, the Butler Model C-40 has a double action: the rectifier section removes and prevents formation of mineral and rust scale, and stops corrosion; the filter section collects sludge in a glass chamber where it can easily be removed. It is easy to install and may be used with or without antifreeze. Its entire action is automatic, and it will reduce oil and gas consumption and engine repairs, Butler says.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 147.

The Butler Model C-40 engine-water filter saves gas and oil.

Bridge Engineer, Oklahoma

D. I. McCullough is now State Bridge Engineer of the Oklahoma State Highway Department. He succeeds his former chief, the late Homer X. White, whose death last October ended his 29 years with the Department.

Mr. McCullough has been with the Department for 28 years, and since 1930 he has filled the post of Assistant Bridge Engineer.

William C. Zwick, associated with the Department for 16 years, has been named Assistant Bridge Engineer.

Snow-Free Runways at Plant

Lining concrete transport runways with heating cable has solved the snow problem at Bucyrus-Erie Co.'s South Milwaukee, Wis., plant.

Last winter, just before the severest weather set in, the company lined four concrete runways, 100 to 275 feet long and about 10 feet wide, with 40,000 feet of General Electric flexible lead-covered heating cable. Specially built G-E step-down transformers supplied correct voltage for the nonstandard lengths of cable. The heating cable was laid on wire mats about 2½ to 3 inches below the surface, on approximately 3-inch centers; and tile drains installed along the edges of the runways provided drainage for the melted snow.

Result—after a heavy week-end snowfall, with the outside temperature at 11 degrees below zero, the cable cleared the runways in a few hours.

Davis Plywood Appoints

P. J. Petrullo has been appointed head of the Technical Service of The Davis Plywood Corp., Cleveland, Ohio. The company maintains this service to supply customers with technical information about plywood.

SAVE 1/3 ON PORTABLE ELECTRIC PLANTS

New Winpower Portable Plants, powered with heavy-duty Wisconsin engines save you approximately ⅓ on purchase price. Especially designed for contractor use. 300 to 10,000 Watts, A.C. or D.C. Quality built for 25 years. Famous for long, dependable service.

Write today for Free literature and prices.

WINPOWER MANUFACTURING CO. — Newton, Iowa

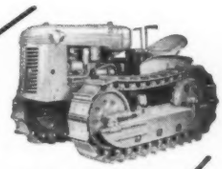
OLIVER

the "CHOICE" Line

When performance under exacting operating conditions . . . where dependability and low operating and maintenance expense are essential, the *choice* of cost-conscious operators is Oliver. Your Oliver Industrial Distributor will be happy to give you all the facts on why this complete line of job-speeding wheel and crawler tractors and matched allied equipment should be *your* choice! The Oliver Corporation, Industrial Division, 19300 Euclid Ave., Cleveland 17, Ohio.

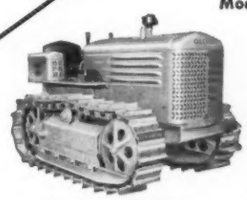
Model "88"—45 h.p. Gas or Diesel

Model "77"—39 h.p. Gas

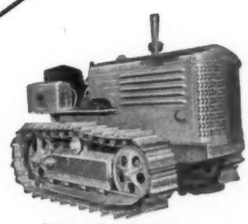


Model OC-3—22 h.p. Gas

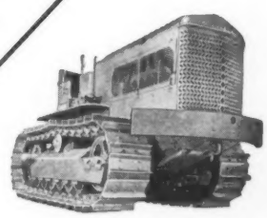
Model "66"—27 h.p. Gas



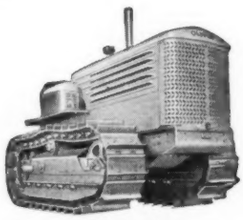
Model A—30.5 h.p. Gas or Diesel



Model B—38 h.p. Gas or Diesel



Model FDE—110 h.p. Diesel



Model D—61 h.p. Gas or Diesel

THE OLIVER CORPORATION

A complete line of industrial wheel and crawler tractors

Factory Framework Welded in 70 Days

Steel Fabbed at Site and Erected by Novel Method; Crews Small and Equipment Simple; Economy Results

• SINCE time has never represented more money than it does now, a faster method of constructing welded steel buildings is especially newsworthy.

Such a method, which makes it possible to enclose large areas, in a hurry, with minimum labor and expense, has been developed by Repp & Mundt, Inc., contractor of Columbus, Ind. The method is flexible and permits plan changes during construction with no penalty to contractor or owner. It involves small crews and simple erection equipment. And it virtually eliminates steel-scrap waste.

A factory comprising more than 120,000 square feet and containing 500 tons of steel serves as an example. All steel on this large job was set and welded between April 15 and August 1, or about 70 working days. The steel, including erection cost, came to $150 per ton as against $195 per ton for conventional fabrication and erection methods.

Change of Plans

The factory was an extra one for Hamilton Mfg. Co. in Columbus, Ind. It was planned as a one-story structure 240 x 420 feet. But as a result of an influx of orders, the owner decided on a second story 80 x 240 feet after construction had started. To add this second story it was necessary only to increase column and beam sizes for the first floor and put the columns and beams intended for the first floor on the second. Neither owner nor contractor was penalized in money or time.

A stiffleg derrick on a wheel platform sets a column for the Indiana factory. Repp & Mundt flame-cut all steel on the site and welded it in place.

Design

The single-floor section of the building uses 6 x 6-inch H-beams and 12-inch standard I-beams. Bays are spaced 20 feet each way on centers. On the section which supports the second floor, columns are 8 x 8-inch and beams are 12 x 12-inch H. The second-floor loading is 200 pounds per foot.

Walls are made of concrete for 5 feet, then steel sash and corrugated Transite bolted to steel framing. Floors are concrete slab. The roof is a wood-deck built-up type, with most drains running down inside the channel of the H-columns. It is supported by welded-steel truss-type joists designed for a load of 40 pounds to the foot.

Steel Erection

Repp & Mundt used stiffleg derricks — sometimes a crane — to raise the columns to position on embedded base plates. The columns were plumbed with an ordinary level and welded in place. When enough columns were welded to base plates to accommodate a beam, the derrick hoisted a beam, its level was checked, the column plumb rechecked, and then it was welded. Steps, brackets, and braces were cut and welded as needed.

Standard lengths were used throughout. All cutting was by flame, on the job. Gas-engine-driven Lincoln welders of 200 amp and Fleetweld No. 5 electrodes handled the welding.

Five-man crews did the cutting, erecting, and welding. They consisted of a foreman, 2 welders, and 2 journeymen. The latter handled plumbing of columns and leveling of beams under the supervision of the foreman and superintendent, and helped position the steel for welding. During part of the time, work was speeded by using five of these 5-man crews, each working independently and each setting columns and beams.

Besides five welding machines, equipment consisted of one power crane, part time, and two 1½-ton stiffleg derricks mounted on wheel platforms of welded steel, each with hand winches.

(*Concluded on next page*)

"I got started right...

"Early in my experience, I learned how important the selection of a surety could be . . .

"It was a heavy job we were after . . . one of our first big ones . . . located outside our usual working territory. We were in good shape for it, but fairly green and practically unknown beyond the county limits. A surety company with less foresight and good judgment might have backed away . . .

". . . *but the Ætna's bond men had a refreshingly broad knowledge of the problems of our business—plus an uncanny talent for getting all the facts.*

"They wrote the bond. We got the job, too . . . and the prestige of the Ætna name didn't exactly hurt us any with the awarding authorities.

"Through the years, we've had many reasons to be grateful for the promptness, experience, and all 'round reliability of the Ætna Casualty and Surety Company—and they've never given *us* reason to doubt the wisdom of our choice."

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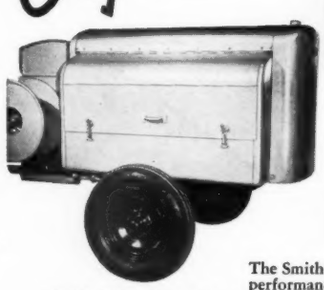
MODEL 105-P

AIR COMPRESSOR



Model 105-P. Has self-starter, battery ignition, voltage regulator, large radiator capacity with thermostat for quick warmup.

The Smith 105-P delivers smooth power, gives long performance, and will handle most of your compressor work, for less! Powered with Chrysler Ind. 15 Industrial Engine with 377 cu. in. displacement. Delivers 105 cu. ft. per minute. Has sodium cooled valves and Stellite valve seats in engine. Stainless steel disc type valves and Manganese Bronze seats in compressor. Heavy duty with light weight (2100 lbs.). *Write for literature and prices.*

Also the SMITH 70-P AIR COMPRESSOR

GORDON SMITH & CO. 483 COLLEGE STREET BOWLING GREEN, KY.

Savings

The entire building was produced for $3.75 per square foot, including a sprinkler system, boilers, storm sewers, sanitary and industrial-waste sewers, electric light and power wiring, and washroom facilities for several hundred factory workers. The unorthodox but effective methods of fabricating, erecting, and welding steel accounted for much of the savings, according to W. A. Repp, who says, "We just went into the open field with the plans, and started pouring concrete in which we set base plates for steel columns."

An important dividend accrued to the owner: he was able to use half of the building space for temporary storage 90 days after construction started.

Repp & Mundt created similar savings recently in the construction of an $800,000 steel-framed plant for Stadler Packing Co. in Columbus. It is made of ceramic tile inside and out, on a welded steel framework, and its good looks and substantial nature, as well as the speed and economy of its production, have attracted visits from engineers of many states.

Steel Bridge Floor

A rectangular steel bridge floor designed for H-20 loading has been developed by Kerlow Steel Flooring Co., 222 Culver Ave., Jersey City 5, N. J. Laid longitudinally or transversely on a bridge, it will carry an H-20 loading on a 15-inch circle up to a span of 48 inches. It weighs approximately 19 pounds per square foot.

IQ-35 is available with the grating parallel with traffic or transverse to the traffic. In the latter type, the transverse bars that the tires ride on are placed higher than the longitudinal bars. The transverse bars are also serrated to enable tires to maintain or develop greater traction for emergency stopping. The grating is finished with a red lead paint specially developed for Kerlow.

A related open-steel flooring, Series CB Standard Rectangular Pattern, is also available for industrial use. This flooring is forged under 500-ton hydraulic pressure with a positive dovetail-lock construction. It is swaged cold to prevent internal strains which might cause warping. Slotting terminates above the neutral axis of bearing bars to provide maximum strength. Cross bars extend below the bottom of the slots to eliminate the possibility of lateral deflection.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 210.

A Driveless Counter

A driveless counter for indicating mileage and number of wheel revolutions has been produced by Knopf Instrument Co., 250 Culver Ave., Jersey City 5, N. J. Hermetically sealed, without any outside driving parts, the Pe Ka Driveless Hubodometer will register both backward and forward movements. It remains in an upright position at all times and may be read while the wheel or shaft is in motion. The company points out that the unit is easy to install and is sealed against dust, moisture, and grease.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 110.

The Pe Ka Hubodometer for indicating mileage and number of wheel revolutions registers forward and backward motions—and remains in the proper reading position always.

Colonel E. P. Ketchum Is VP

Mount Vernon Contracting Corp., Mount Vernon, N. Y., announces the election of Colonel E. P. Ketchum, Corps of Engineers, U. S. Army, as Vice President of the company. Colonel Ketchum, who is well known in the construction industry, retired from the Army last July after 34 years' service. His last military assignment was District Engineer of the New York District.

At DIGGING and LOADING— It's a PIPPIN!

The PIPPIN EXCAVATOR — a combination digger and loader attachment for Ford and Ferguson tractors —

- Back hoes, front hoes, shovels and loads
- Converts from back to front hoe in five minutes
- Digs 7' deep. Back hoe buckets available from 15" wide to 37" wide.
- Bucket capacity 1/5-yd.
- Bucket elevates to 14' above grade
- Load swings laterally to 110 degrees

For greater work capacity and lower costs, get a PIPPIN!

WRITE FOR CIRCULAR

PIPPIN CONSTRUCTION EQUIPMENT CO., Inc., White River Junction, Vt.

BUCYRUS ERIE
HYDROCRANE
Here an H-3 sets a 4,800-lb. section of 30-in. pipe. Note that with boom telescope retracted, crane works easily under trees.

Precision Control Hydrocrane "Cushions" Pipe Into Place

With every crane function fully hydraulic, operator can meter power flow so slowly you can barely see the load move — or he can speed operation to provide a fast, even work pace.

Here's what hydraulic action and pin-point control can mean to you:

TELESCOPING BOOM noses under branches, wires, into windows, freight cars — without moving crane an inch. Pipe sections, valves, hydrants can be eased into place quickly, accurately without damaging trees, power lines.

"DEADMAN CONTROL" provides automatic protection for pipe crews. If operator should let go, lever returns to neutral — load stops dead. Pipe can be inched into place with greater safety to men.

EMERGENCY STAND-BY. Crane's 50 mph. top speed cuts travel time on leak repairs. Fast action hydraulic outriggers extend in seconds — provide a firm, solid base, even on rough ground.

SIMPLE TO OPERATE. Hand levers only — no tricky hand-foot coordination, no brakes and clutches to grab or slip. That's why inexperienced men become proficient Hydrocrane operators in amazingly short time.

Two sizes — 1/4-yd. 2-ton, 3/8-yd. 3-ton. Attachments include clamshell, crane hook, 1-yd. material handling bucket, catch basin bucket, grapples, magnet.

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☐ I want a Hydrocrane demonstration.

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Safety Records Rate Presentation Watches

Last summer Peter Kiewit Sons' Co., Omaha, Nebr., presented two gold watches—the first in a program of such awards—to Leonard Oates and Harry Edwards, who each supervised more than 100,000 man-hours of work on the Garrison Dam embankment project without a single lost-time injury to any man in their crews.

The awards for these fine safety records were made at a special dinner in the mess hall at the project, attended by all job supervisors. Ben Williams, Project Manager of the embankment job, emphasized the important part played by everybody concerned in the work, and Bill Koeppen, of the firm's Omaha office, presented the awards. Though the gold watches go only to foremen who reach the 100,000 man-hour safety mark, several other foremen are nearly there already. Their merit cards are but a few of the scores of such cards representing various manhour totals without any lost time injuries, earned by supervisors on different jobs.

Bill Koeppen (left) of the Omaha office of Peter Kiewit Sons' Co., presents gold watches to Foremen Leonard Oates (center) and Harry Edwards in recognition of their fine safety records.

The 18-jewel gold-case Hamilton watches are moistureproof and have radium dials and sweep second hands. They are engraved on the back with the foreman's name and the award date.

Fall Meetings in Penn. On Roadside Development

A Division II Coordinators' meeting on Roadside Development was held last September at Pennsylvania State College for a field trip and a general give-and-take of ideas and problems. All states in the division but Delaware were represented. W. L. Hottenstein, Division Coordinator, called the meeting.

Led by Dr. H. B. Musser of the College Department of Agronomy, the group visited experimental seed plots near Port Matilda and Marengo, P... Mr. Hottenstein and Dr. Musser sparked this project, which was developed cooperatively by the college and the Pennsylvania Department of Highways. Mr. Hottenstein will give a full report on it at the January Highway Research Board meeting.

After lunch at a roadside rest near Bellefonte in Centre County, the group examined other experimental turf plots at the college grounds and had a final meeting at Nittany Lion Inn.

During the two days just before the field trip—September 18-19—HRB Roadside Development Committee members and some subcommittee chairmen and members held a special session at Hershey, Pa., to discuss a series of bulletins the Roadside Development Committee plans to prepare. The bulletins will eventually be compiled into a roadside development manual. The group was also addressed by E. L. Schmidt and W. H. Herman, Chief Engineer and Chief Research Engineer, respectively, of the Pennsylvania Department of Highways.

The Right Antifreeze

Some types of antifreeze can damage your car, the National Bureau of Standards warns car owners. The Bureau has published a booklet called "Automotive Antifreezes", which describes in detail winter radiator solutions, good and bad. The booklet also discusses how to clean and prepare the cooling system and emphasizes that this should be done early so that antifreeze may be put in about the time of the first frost.

Conclusions reached by the NBS are that the safest antifreezes for ordinary use are ethylene and propylene glycol as well as the simple alcohols such as wood alcohol. Antifreezes made with a salt base or from petroleum distillates similar to kerosene are definitely harmful. The experiments leading up to these conclusions proved that salt-base solutions (such as calcium, magnesium and sodium chlorides) cause strong corrosive action and may eventually cause the motor block to crack. Petroleum-base antifreezes have different harmful effects—they are highly inflammable, they cause rubber hose connections to deteriorate, and their boiling points are far too high. Only the simple alcohols (methyl, ethyl, and isopropyl alcohol and ethylene and propylene glycol) are completely safe, not being easily ignited and having little corrosive action. An easy test of identification is to ignite rags soaked in the different solutions. The alcohols burn with a clean blue flame; petroleum-base solutions cause a smoky yellow flame; and salt-base antifreezes do not burn.

"Automotive Antifreezes" may be obtained by sending 15 cents to the Superintendent of Documents, Government Printing Office, Washington 25, D.C., requesting NBS Circular 474.

GOLDEN ANNIVERSARY — AMERICAN ROAD BUILDERS ASSN. — 1902 1952

Plan Now to Attend...

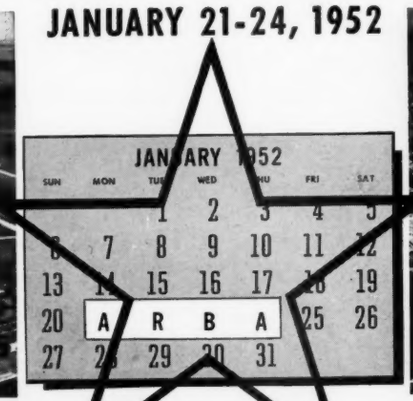
THE GOLDEN ANNIVERSARY MEETING OF THE

AMERICAN ROAD BUILDERS' ASSOCIATION

RICE HOTEL HOUSTON, TEXAS

JANUARY 21-24, 1952

San Jacinto Monument and U.S.S. "Texas."



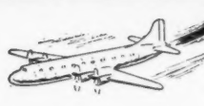
Gulf Freeway in Houston.

Then on to Mexico

TRAVEL BY PLANE WITH CONGENIAL COMPANIONS

TO **Mexico City and Acapulco**

JANUARY 25-FEBRUARY 3, 1952



VISIT famous shrines, ancient ruins and witness thrilling bull fights . . . indulge in exciting deep sea fishing . . . partake of renowned Mexican hospitality . . . stop at the best hotels . . . ride in luxurious motorcars with English-speaking chauffeurs . . . enjoy 6 to 9 days of delightful relaxation following the ARBA meeting.

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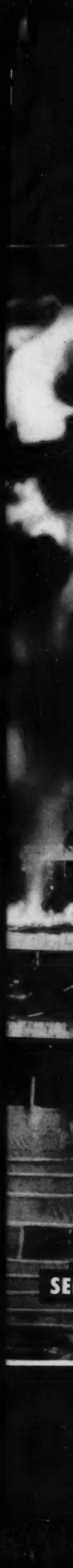

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The Victor L. Phillips Co., Kansas City, Mo.
Prime-Best Inc., Milwaukee, Wis.
Rish Equipment Co., Charleston, W. Va.
Rish Equipment Co., Cincinnati, Ohio
Rish Equipment Co., Richmond, Va.
Rish Equipment Co., Roanoke, Va.
The Salt Lake Hdwe. Co., Boise, Idaho
The Salt Lake Hdwe. Co., Grand Junction, Colo.
The Salt Lake Hdwe. Co., Salt Lake City, Utah
Sierra Machinery Co., Reno, Nevada
Speer Hardware Co., Ft. Smith, Ark.
Standard Machinery Co., San Francisco, Calif.
O. S. Stapley Co., Phoenix, Ariz.
Stillwell Supply Corp., Long Island City, N. Y.
Trevor Corp., Buffalo, N. Y.
Tulsa Equipment Co., Tulsa, Okla.
The W. T. Walsh Equipment Co., Cleveland, Ohio
R. B. Wing & Son Corp., Albany, N. Y.
Wolf Tent & Awning Co., Ft. Wayne, Ind.
Woodbury Co., Portland, Ore.
Zork Hardware Co., El Paso, Texas

Brother, I know . . . I've seen many a construction investment go up in smoke because of tarpaulins spreading fire. Sparks from a welding torch, a salamander set too close to a canvas windbreak, cigaret butts, etc., were the initial cause, but it was the inflammable tarpaulins that spread the fire through the entire job.

No need to take this risk—now you can get real fire insurance in flame-resistant tarps and at practically the same cost as ordinary tarps. You can prevent ruinous fires and costly delays. Yes, with FlameZel Tarpaulins you can leave the job knowing that your tarps won't kindle costly fires.

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ASK YOUR DISTRIBUTOR FOR A BLOW TORCH DEMONSTRATION ON FlameZel

Meets the fire resistant requirements of Federal Specifications CCC-D-746. Manufactured under Wenzel Patents No. 2286744, No. 2436216, No. 2463983 and others.

Section showing Rope Bound Edges. Construction Patent No. 2562005.

EXTRA STRENGTH AT NO EXTRA COST!

New this season, all FlameZel Tarps are equipped with heavy duty rope bound in edges all around. Prevents rips and tears from starting; grommets won't pull out.

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Treated by WenZel
Fire, Water & Mildew Resistant
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The greatest protection and longest life, yet priced in the range of ordinary tarpaulins.

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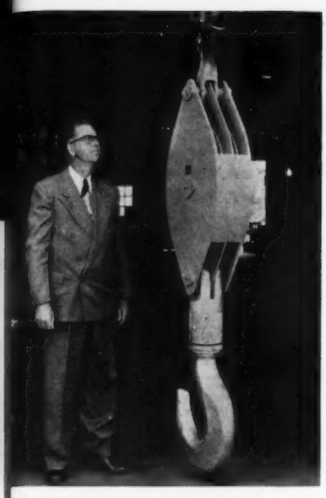


The U. S. Navy, at Terminal Island, Calif., has selected this hook-type free-turning Miller swivel for use on a 50-ton hoist.

ree-Turning Swivel For Use on 50-Ton Hoist

A new type of swivel for large hoist- operations, the Miller Angular rust swivel (Model J-1), has been lected by the U. S. Navy for use on 50-ton hoist at Terminal Island, Calif. his installation may be of interest to her riggers, since Miller swivels are ailable in sizes required for all types wire-line hoisting operations.

Manufactured by General Machine & elding Works, 1100 E. Second St., omona, Calif., these swivels utilize the tire bearing surfaces of a number of ces of angular-contact ball bearings. nce the load is able to turn freely, cessive line wear, breakage, fouling, d accidents are reduced, Miller ints out.

Further information may be secured m the company. Or use the Request rd at page 16. Circle No. 151.

Synclinal Filters

A line of synclinal-type filters for ncorrosive liquids in hydraulic and w-pressure systems is made by Mar- l Engineering Co., 625 W. Jackson vd., Chicago 6, Ill.

The filters come in 5, 8, 10, 20, 30, , 75, and 100-gpm sizes; the two rge-capacity units are the newest ditions to the line. All models are ailable in both line and sump types th mesh sizes from 30 to 200. Fea- res cited by the company for the ters include compactness, no wearing rts, easy installation and cleaning, d a large filtering area. The filters n be installed, disassembled, cleaned, d reassembled on the spot by the

Marvel synclinal filters feature a large active filtering area in a small space. They come in line and sump types.

average workman, the company says. The new 75-gpm model measures 12½ inches over-all and is 6 inches in diameter; the 100-gpm model is 14 inches over-all and 6½ inches in diameter.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 184.

Lubricants, Cutting Oils, Rust Preventives, Etc., Listed

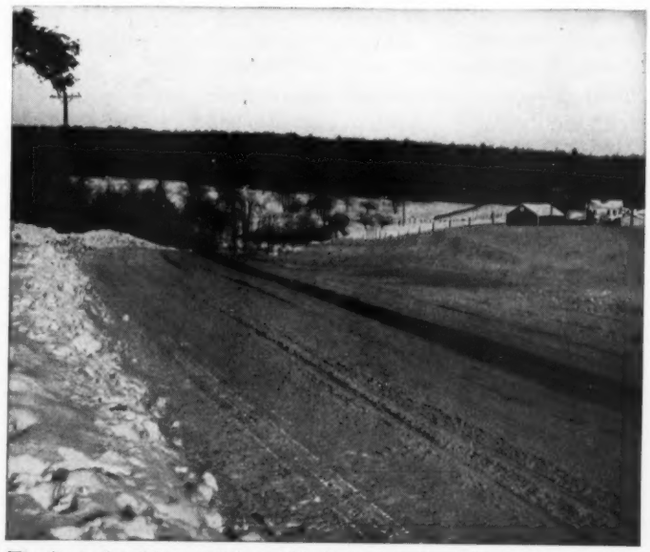
An 8-page booklet entitled "Houghton's Government Specification Products" is offered by E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa. It lists all Houghton products meeting governmental specifications in the following classes: rust preventives, lubricants, metal-working aids, cutting oils, and leather and synthetic-rubber products. The listing includes the specification number, name, and description of the approved product.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 156.

American Concrete Institute officials inspect a St. Louis warehouse in which the reinforcement and the form for the concrete are combined in one permanent steel product, Cofar. MacDonald Construction Co. is the contractor.

BETTER ROADS the YEAR 'ROUND

Blending with every landscape and free from glare, roads built with Tarvia* road tar take the strain out of driving. They are self-healing under impacting traffic.



The heat-absorbing qualities of black roads built with Tarvia* road tar make them easier to keep open in winter, as snow and ice melt more quickly. And they are not affected by chemicals used to remove snow and ice.

because

1 Roads built with Tarvia* road tar improve with age. Occasional applications will renew the life of the surface, and replace worn-away material.

2 TARVIA road tar penetrates surfaces and binds together the underlying material. It thus makes possible the inexpensive use of local aggregates.

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4 TARVIA road tar is unaffected by gasoline, kerosene, or moisture. It retains its original properties.

5 TARVIA road tar holds the aggregate tightly in the surface, and produces a gritty surface which is lastingly skid-resistant.

6 TARVIA road tar may be applied at moderate temperatures, and with ordinary equipment.

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Contractor Says Safe Ways Are Save Ways

President of Volpe Construction Co. Suggests Ten Times Ten Ways to Save a Buck With the Help of a Safety Program

Do you realize that in 1950 accidents caused 2,300 deaths and 205,000 injuries in the construction industry? That there were 93 deaths and 8,300 injuries per 100,000 construction workers? That the average for all other industries was only 27 deaths and 3,360 injuries per 100,000 workers? That only one other industry, mining, had a worse death record? And that the frequency rate for disabling injuries in construction was double the average for all industries?

If you want to stop this loss of life, time, and your own good money, here are some ways which John A. Volpe suggested at the National Safety Council's Congress in October, during the meeting of the Construction Section. The ways he listed numbered 100—ten under each of ten major headings. We summarize them here as follows:

• GENERALLY speaking, the construction industry has not been sold on the need for an organized safety program integrated with construction activities. This is because top management is apt to place production and time schedules in the foreground, and safety in the background.

The first step, then, is to get and keep top management's interest in a safety program.

1. Get, Keep Management Interest

Though safety begins as a humane problem, its result is economic as far as the contractor is concerned, and it sometimes becomes necessary to substitute dollars and cents for emotions to win management over to the side of safety.

That involves making management aware of some facts and figures. For instance, the average disabling injury has a direct cost of about $750, and indirect costs three or four times greater. Yet an expenditure of 0.5 per cent of total payroll dollars could probably reduce disabling injuries from 19 to 3 or 4 per million man-hours, with a dollar saving staggering to calculate.

Management should be shown that sales are often won or lost as a result of insurance costs, which are based on accident experience. (On a $6,500,000 job in the Boston area, the difference in the insurance premium on the estimated payroll of the low bidder and the fourth bidder was $60,000). Management should be reminded that on invitation bids and cost-plus work, insurance costs are a major factor when closely qualified contractors are being considered; that though most costs are roughly the same for contractors, the one variable which the individual contractor can most easily control is the cost of insurance; that if all contractors improved their accident rates, the over-all rates would go down statewide. (Witness the midwest steel erectors who lowered their rates when they instituted an effective accident-prevention campaign.)

Any well integrated program must flow from top management through all operations—from the "Old Man" down to the lowest-paid worker on the job. But it isn't enough to begin such a program; it must be followed up and its progress relentlessly checked. It must be kept constantly on the minds of all concerned, thoroughly publicized.

2. Publicize Safety

A letter to each new employee, letting him know he is now a member of a team which thinks and works safely; a monthly letter to all employees telling of progress made in accident prevention; a monthly booklet such as the "Safe Worker" published by the National Safety Council; posters, signs, accident scoreboards, safety flags; pins and emblems on which some time and money have been spent (not the "tin badge" variety)—these are some of the ways to publicize your safety program to your employees.

(*Continued on next page*)

Do your sealcoating and ice control jobs the fast easy Swenson way. Spreads salt, chloride, sand or cinders any width or amount desired.

Free Information

Swenson Spreader & Mfg. Co.
Lindenwood, Illinois

Make your UNDERWATER SURVEYS easier... with a BLUDWORTH DEPTH RECORDER

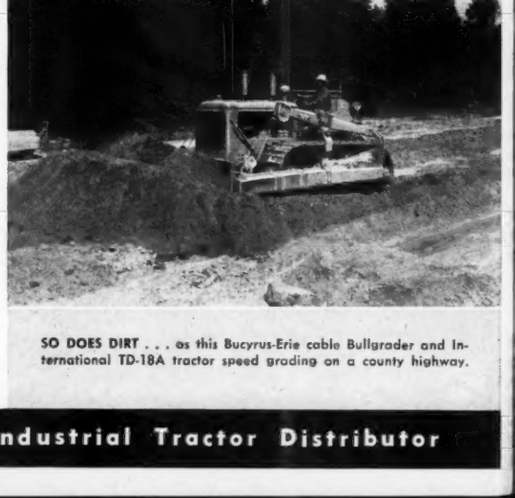
Write BLUDWORTH MARINE 92 Gold St., New York

STUMPS, ROCK or DIRT

BUCYRUS-ERIE BULLGRADERS ROLL RIGHT THROUGH

OUT GO STUMPS — DOUBLE QUICK — Underbrush and stumps are rooted out in a hurry as this pair builds streets for a new subdivision. At left, an International TD-14 with Bucyrus-Erie hydraulic Bullgrader. At right, International TD-18 with Bucyrus-Erie cable Bullgrader.

ROCK GOES TOO — Here a Bucyrus-Erie hydraulic Bullgrader and International TD-9 tractor clean out a rock pile. Note the excellent operator visibility.



SO DOES DIRT . . . as this Bucyrus-Erie cable Bullgrader and International TD-18A tractor speed grading on a county highway.

STUMPS, rock, clay, dirt — whatever the material road builders are up against, they can depend on Bucyrus-Erie Bullgraders to keep it rolling — fast.

Bucyrus-Erie "Power Point" Bullgrader design matches the Bullgrader so exactly to the International tractor that tractor *power* is concentrated right at the *point* where it belongs — the blade. And the blade is scientifically curved to keep dirt live and rolling — the easiest and cheapest way to move it.

In addition, Bucyrus-Erie Bullgraders are built to last. Pearlitic manganese steel gives the blade an armor face that takes the roughest kind of punishment — and comes back for more. For full details, see your nearby International Industrial Tractor Distributor.

266TS1

BUCYRUS ERIE
SOUTH MILWAUKEE, WISCONSIN

See Your INTERNATIONAL Industrial Tractor Distributor

The public, too, should know about . So invite the press and local municial officials to some of your safety eetings. If you would avoid the hosity contractors often meet in a new wn, let its people know what you e doing to protect the safety of your mployees and the property and lives the townspeople themselves.

Join national trade associations and he National Safety Council, draw on heir experience and help, compete in he safety contests they hold for varius types of contractors—both for the ake of publicity and for the sake of he new ideas they will give you.

Make it difficult for accidents to hapen, but if they do, make it difficult r them to go unnoticed. When your ecord is good, publicize it, and when starts going badly, let your employes know it.

3. Tailor Program to Job

A general safety program is not nough. Tailor it to the particular job hand, first by assigning the responsiility for it to capable personnel. This ay be the superintendent on small obs. But more often it must be a spe-ial safety man or a safety committee hich can devote some working time guiding job safety.

Impress safety on your personnel om the very start of the job, to avoid hose serious accidents that come in he initial rush to get a job going.

Require your superintendent to subit short weekly reports on safety; that ill keep safety on his mind all week. equire foremen to investigate all serius accidents on the job and report on auses and on steps taken to prevent ecurrence. It will help if superintendnts and foremen have copies of the GC "Manual of Accident Prevenon". Encourage employees to make uggestions, to report all unsafe condiions, and to assume job safety as a ersonal problem. Above all, plan each peration before it starts, and plan it afely. The safe way is the best way.

4. Make Safety Competitive

Monthly, quarterly, and yearly wards of money to superintendents nd trade-group foremen with the best afety records and with no lost-time ccidents will give a safety program a remendous boost. The awards should e financially profitable, but they hould also furnish a feeling of satisfaon at winning something.

Award presentation by the boss at a nonthly safety dinner is a good idea—ublicized in the press where possible.

5. Indoctrinate New Employees

Indoctrinate your new employees the inute they are hired. Let the new man now he is now working for a firm that olds safety to be of primary imporance on the job. Question him about is previous work record and place im, if possible, on an operation he is amiliar with and does not fear.

See that he is taught by his foreman ow to do his job safely—especially if e is working around mechanical tools here there is much repetition and herefore much danger of accidents. amiliarize him with general safety olicies and the necessity for good job ousekeeping. Warn him to report all nsafe working conditions to his foreman and to seek first aid immediately or the smallest injury.

Properly indoctrinated, he is more pt to assume personal responsibility or his own safety and to take pride in he job's safety record.

6. Support From Insurance Carrier

An important source of help in setting up and carrying through a safety rogram is the insurance carrier. Its ngineering department can advise on rograms, and on specially hazardous perations. Its safety engineers can vis your jobs and rate them in comparion with other jobs they service. They can often come up with a fresh viewpoint on methods which may be outdated, and generally serve as a useful clearing house for ideas.

The contractor, on his part, should make it clear to the carrier that he wants his service. He should ask for it if necessary. He should ask the carrier, for instance, to submit quarterly accident statements broken down by jobs and foremen, listing all accidents and indicating the compensation and medical costs; such a report will show him where more safety effort is needed. He should ask that a carrier representative sit down with him each year when new insurance rates are promulgated to review the past year's record and explain the causes of the present insurance charge or credit. He should ask for help when bids are being figured and insurance rates must be included—particularly out-of-state; the rate differential between states can amount to a sizable difference in bid prices and hence affect the winning or losing of jobs.

7. Adequate First Aid

Your insurance carrier also stands ready to help you establish adequate first-aid facilities on your jobs. He will set up and supply your station and may also procure a qualified first-aid attendant or nurse.

(Concluded on next page)

. . . designed for fast-moving, fast set-up and high daily production!

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THE MADSEN
SMALL, PORTABLE, HIGH-CAPACITY ASPHALT PLANT

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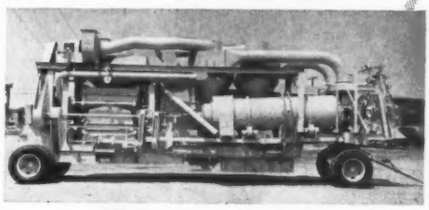

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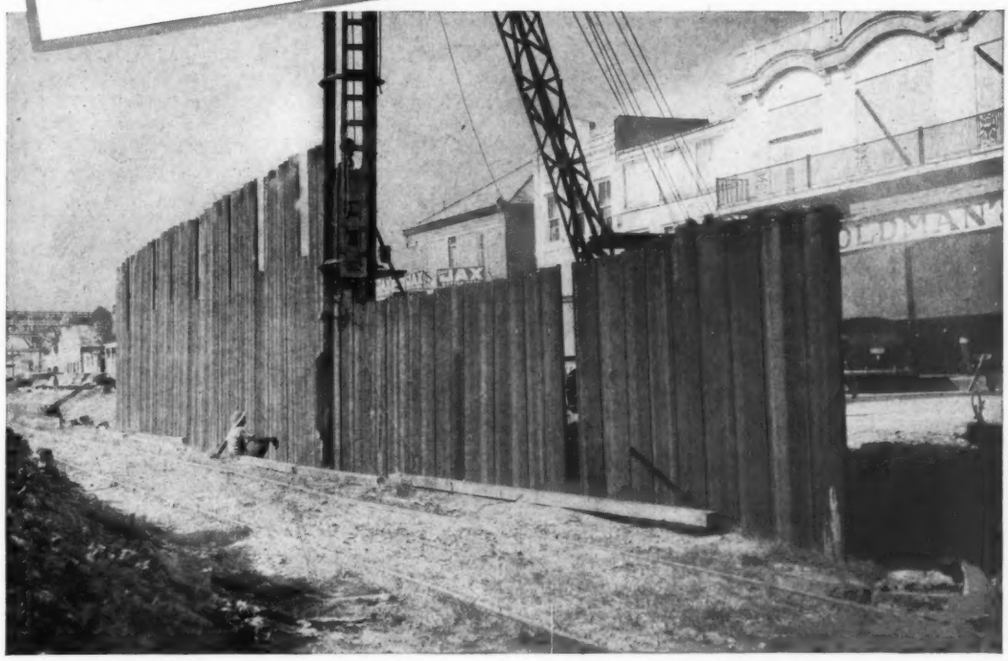
McKIERNAN-TERRY PILE HAMMERS aid flood control



A McKiernan-Terry No. 7 Double-Acting Hammer drives piling north of the highway bridge on the Berwick side of the river.

No longer will flood crests sweep through the streets of Morgan City and Berwick, La. on opposite banks of the Atchafalaya River, because new reinforced-concrete walls, set on piles, are well above previous flood heights. To drive both the steel sheet and timber piling on this vital job, McKiernan-Terry Pile Hammers were chosen by Hendry Corp., the contractor.

On the Morgan City floodwall, a McKiernan-Terry No. 9 Double-Acting Hammer was used to drive 20 ft steel sheet piling and 35 ft timber piling on a batter into clay and silt. Steam was furnished by a portable boiler pulled along on skids.

A McKiernan-Terry No. 7 Double-Acting Hammer punched down steel sheet piling up to 35 feet in length for the 5,278-ft Berwick floodwall. Compressed air powered the hammer.

For flood control, bridge building, highway construction and many other types of construction, McKiernan-Terry Pile Hammers and Extractors are giving dependable, economical service. It's a profitable move to investigate this wide-range line.

Bulletin tells everything you want to know about McKiernan-Terry's 16 sizes of single-acting and double-acting hammers and 2 sizes of double-acting extractors. Write for your copy today.

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Plants: Harrison, New Jersey, and Dover, New Jersey

Contractor Says Safe Ways Are Save Ways

(*Continued from preceding page*)

"Qualified" is an important word. We will probably never know how much time, money, and suffering has been wasted by "Band-Aid-Bungling" by unqualified personnel. And it doesn't take a very large job to pay the way of a good first-aid man. On a large housing project a record was kept of all cases handled by the contractor's certified first-aid man; figuring the time that would have been lost in traveling for medical attention, the contractor saved a net $200 a week—well worth saving!

Employees should be taught to "get first aid first", before a cut or puncture turns into an infection. And first-aid supplies should be checked and maintained on each job whether or not there is a first-aid attendant. It's too late to order supplies after an injury has occurred.

8. Public Safety, Property

An indirect part of accident prevention is the necessity of seeing to public safety and protecting property. This means checking plans for hazardous operations such as blasting, foreseeing and correcting fire hazards, erecting warning signs to protect the general public, keeping dangerous playthings out of reach of "small fry", routing vehicles so as not to interfere with traffic in the area, and a thousand other matters.

As with compensation coverage, your coverage for property damage and public liability is rated by your experience, so the better the job you do in preventing property damage, the lower your coverage rates will be. A good job will also show strangers in the area you are interested in their welfare, and may do much to eliminate hostility and the institution of nuisance claims. That saves money, too.

Finally, examine your bid price to make sure you haven't omitted necessary precautionary measures. Don't put yourself in the position of having to use only half-safe measures because your price was too low. Such ill-advised economy saves no money.

9. Promote Good Housekeeping

An efficient job is a safe job, a safe job is a clean one, a clean job is a less-expensive one. Why?

Constant job clean-up will tell you where every stick of lumber is—no more of that material-shrinkage mystery. The flow of materials will be smooth; unused materials won't be buried and have to be dug out later when needed. Rehandling will be reduced. Moreover, a purposeful and regular housekeeping survey can disclose all sorts of potential trouble-makers—a leaking fuel drum, unprotected cement—that might otherwise develop into a loss far greater than the salary of the inspector for a quarter of an hour.

The rules are simple: dispose of trash and loose objects; pile all materials; and park all tools and equipment where they belong. But a cleanup crew can't possibly take care of all this housekeeping; it's up to each man to do his share—and not once a week, but every hour of every shift.

Even a sidewalk superintendent can tell how safe a job is, just by looking at it.

10. Safety in Job Operations

It is impossible to be specific about safety in actual job operations, but certain principles and suggestions apply generally:

It is not so much ignorance of rules as failure to enforce them that causes accidents. . . A few minutes devoted to safety can pay great dividends; hence the value of the short but frequently held tool-box safety meeting in which the foreman briefs his gang on some particular hazard. . . Unsafe acts of employees cause more accidents than unsafe conditions, so concentrate on employees through the man most closely associated with them, the foreman. . . Special pieces of equipment offer special hazards, so be sure employees are in the know before they are allowed to operate them. . . Excavation still causes many unnecessary fatalities, so enforce the rules for shoring and stay-bracing of unstable material. . . Don't substitute speed for safety in concreting operations; the accident that may result will obliterate any saving in the per yard cost of pouring.

It is perhaps too idealistic to suppose that we can operate week in and week out without injury to a worker. But it is good business to try, because by so doing we are going to eliminate the large percentage of them. If we do, we'll have better production, because men working under safe conditions produce more than those working under unsafe conditions. Better production means profit on a job and tends to lower costs. And lower building costs are a gain for the employee, the contractor, and the community.

A Round Two Dozen Plants

The opening of the twenty-fourth plant in a network stretching over ten states is the latest news from Universal Concrete Pipe Co., Columbus, Ohio. The new plant is located at the south end of Court Street in Florence, Ala., and will be under the supervision of A. E. Morris, Decatur, Ala. The plant will make pipe in sizes of 4, 6 and 8 inches. Larger sizes will be shipped in from the Decatur plant.

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EASIER-FASTER
BLAST HOLE
Drilling

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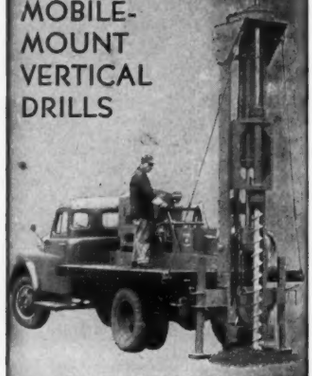

● You're set to drill all ordinary rock formations when you're equipped with mobile-mounted McCarthy Vertical Drills. These heavy, rugged McCarthy units are compactly designed for truck, half-track, cat or "jumbo" mountings. They're easy to move about, easy to set up. They're equipped with finger-tip hydraulic controls; your choice of electric, diesel or gasoline power units.

Recently, on one difficult job, workers using McCarthy equipment drilled an 8-inch hole 100 feet deep in only 40 minutes!

Write today for full facts about McCarthy Drills. See for yourself how you save valuable time on the job by using a McCarthy—the toughest, fastest, most efficient unit ever made.

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Do architects, engineers and contractors know the exact capacity of any standard paver or mixer that pours their jobs today?

The answer is a quick and positive "Yes." Uniform drum sizes have been established and proper mixing capacities guaranteed by AGC Rating Plates. Always look for the AGC Rating Plate when you buy.

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Torque Converter Cuts 99 Per Cent Forward Shifting

A three-stage hydraulic torque-converter transmission claimed to eliminate 99 per cent of forward gear shifting on tough grades is announced by the Twin Disc Clutch Co., Racine, Wis. Combined with engine drag it can also perform 90 per cent of the braking, the company says. The Model DF is a compound unit made up of three major assembly groups: the oil-actuated clutch group, the basic torque converter, and the freewheel assembly. The operator's control valve is equipped with four selections — neutral, torque-converter drive, mechanical drive, and combined engine and hydraulic braking.

The converter was tested with 30-ton-capacity trucks hauling on grades up to 13 per cent at the Mesabi Iron range. One of the field tests involved a dart truck which had been equipped with a Twin Disc three-stage hydraulic torque converter in front of the closely spaced five-speed transmission and the correct rear-axle final-drive gear ratio. According to Twin Disc, this combination eliminated 99 per cent of all forward shifting. The engine picked up speed while the converter multiplied the torque delivered at low rpm. The automatic slip in the torque converter let the start eased the engine into the load and provided smooth acceleration.

The five-speed transmission provided a reverse gear, a power-takeoff drive for the dump body, a low gear ratio for unusually bad holes, and a direct drive.

The automatic torque-converter brake, designed to exert braking effort in excess of engine rated horsepower, is said to perform 90 per cent of the braking job returning downgrade. It reduces air demand on the engine air compressor by 50 per cent and prolongs wheel brake life 100 per cent, according to the company.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 101.

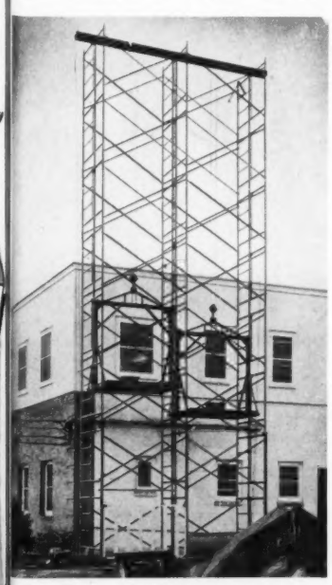
New Hoisting Tower

A material-hoisting tower that assembles with standard Waco sectional scaffolding has been announced by Wilson-Albrecht Co., Inc., 3565 Woodvale Ave., St. Louis Park, Minn. It is available as either a double-well or single-well unit. The double-well tower is designed for simultaneous loading and unloading at top or bottom of alternate wells.

Each tower has a capacity of 1,000 pounds and is powered by interchangeable gasoline or electric power units with hoisting speeds of 100 and 110 fpm, respectively. It features remote or pre-set platform control, a slow-up brake on the power mechanism to govern platform descending speed, and a safety slack brake which sets automatically in case of failure in the hoisting rig.

The hoisting mechanism, which consists of a cage (or cages), a base with a motor mount, and cathead pulleys, is available as a separate package unit.

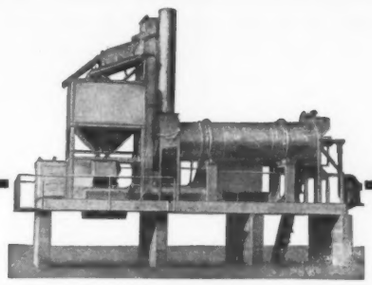
Further information may be secured from the company by requesting Form PS-28C. Or use the Request Card at page 16. Circle No. 122.



The Waco material-hoisting tower is available as either a double-well or single-well unit.

Termite Drills' New Plant

New and larger quarters in Pasadena, Calif., are part of an expansion program undertaken by Termite Drills, Inc., manufacturer of concrete drills. The new quarters are situated at 99 N. Lotus Ave., Pasadena 8, and will provide necessary office space and shipping facilities for the company's increased production.



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Complete stationary hot plants, on 1 steel frame, easily moveable, at reasonable prices. Excellent for medium size city paving. Successful for contractors on all street and highway maintenance; for driveways, sidewalks, industrial plants.

Supplied with oil fired rotary dryer, batch mixer, bitumen heater, vibrating screen, divided hot bin, dust collector, volumetric measure or weigh scales; air controls, engine or electric power.

Sizes: L-12, 12-15 tons per hour. Will pave 25' street, 2" thick, one 300' block per day.
L-25, 25-30 tons per hour. Will cover 20' road, 1" thick, at ½-mile per day.

Also portable repair plants, 4 and 8 tons per hour.

Write for catalog and name of nearest dealer

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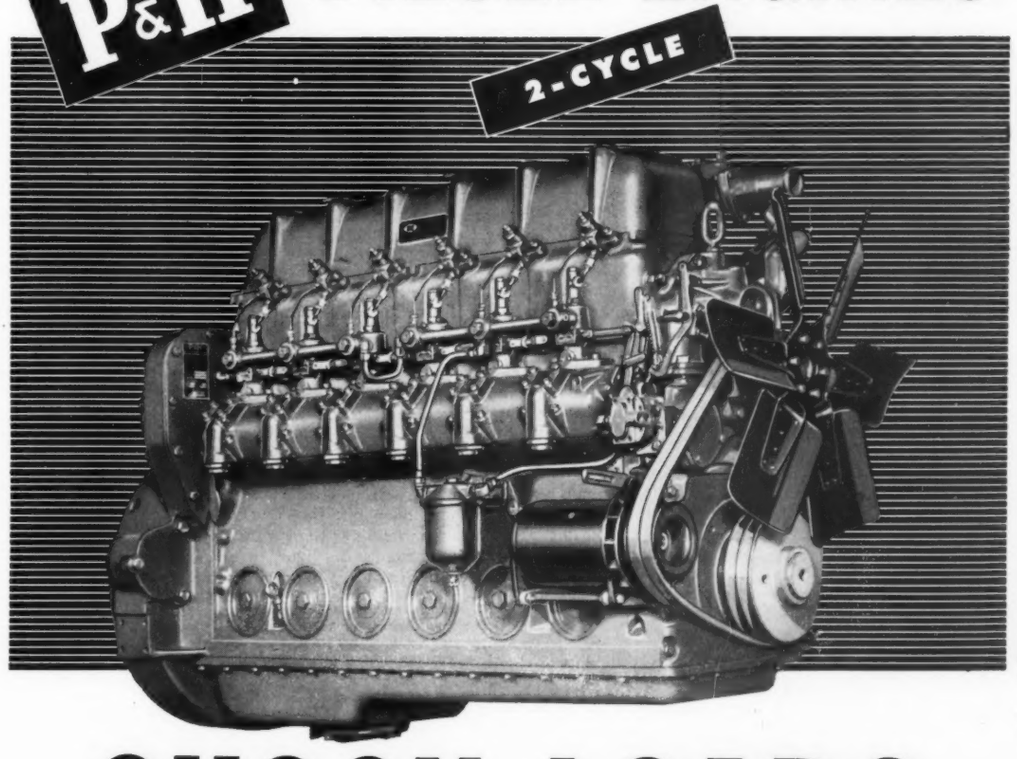

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EVERY 30 SECONDS

That's normal operation for power shovels—the toughest assignment known for diesel engines. It's the service P&H Diesels were designed to take. Years of superior performance, attested by hundreds of users, prove that P&H Diesels can take *any* of your toughest jobs in stride. It's one reason wise users are standardizing on P&H Diesels. There are many other reasons worth learning. For literature, write Diesel Division, Harnischfeger Corporation, Port Washington, Wisconsin.

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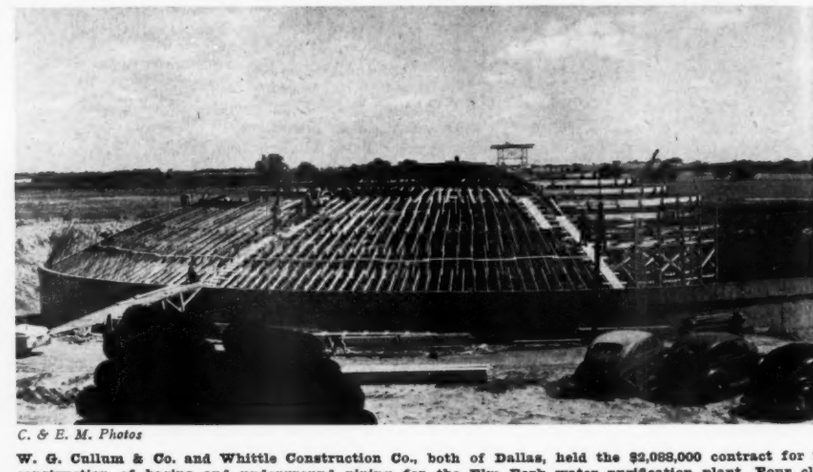


C. & E. M. Photos

W. G. Cullum & Co. and Whittle Construction Co., both of Dallas, held the $2,088,000 contract for the construction of basins and underground piping for the Elm Fork water purification plant. Four clear storage wells of prestressed concrete were included, 187 feet in diameter and 20 feet high. Well wall forms were steel (photo at left). Complicated formwork (photo above) was necessary to support the thin-shell dome roof.

Plant Doubles City Water Supply

Nine Contractors Speed Construction of Purifying Plant

By RAYMOND P. DAY

(*Photo on page* 1)

• EIGHTEEN miles northwest of the civic center of Dallas, Texas, the Dallas Water Department and 9 private contractors have rushed construction of a mammoth new water purification plant. Construction costs for the Elm Fork plant near Carrollton totaled approximately $7,000,000 when the installation was completed in the fall of this year. The plant exactly doubles the city's former 100,000,000-mgd supply of purified water from the Bachman plant 10 miles north of the city.

The need for additional water has been indicated for the past 5 years. Something over 600,000 people now call Dallas home, and by 1970 the population is expected to top the million mark. New industries are moving to the city in droves, and while Dallas is wholly a metered city so far as water is concerned, the presence of industries tends to boost the per-capita consumption. Per-capita daily estimates have jumped from 75 gallons 25 years ago to 121 gallons today.

The Army Corps of Engineers is cooperating with Dallas in the solution of her water problem. Grapevine Dam is under construction to stop floods on Denton Creek, and Garza-Little Elm Dam is under way on the Trinity River. The Elm Fork water plant takes water from Trinity River through double 72-inch lines, at a point below the two Corps of Engineers dams. The city has a small channel dam slightly below the intake point, forming a forebay for the intake.

Nine Contractors

Competition among local contractors for the various parts of the work was keen, and final stages of construction involved 9 firms.

Alliger & Sears of Houston furnished all pumps, motors, and switch gear. This equipment was standardized, and all pumps are DeLaval and all motors and switch gear are Westinghouse Electrical Mfg. Co.

The pumping plant, which circulates the pressure portions of plant water and furnishes power for sending the water on to Dallas, was constructed by E. E. Farrow Co., of Dallas. The contract price was $876,980.

A special elevated steel wash-water tank was built by Pittsburgh-Des Moines Steel Co. at a contract figure of $73,850. The intake line from Trinity River into the plant was built by Whittle Construction Co. of Dallas at a contract price of $497,073.

A $2,088,000 contract for construction of basins and underground piping was pushed by a joint-venture firm of W. G. Cullum & Co. and Whittle Construction Co., both of Dallas. Railroad spur tracks from the Missouri-Kansas-Texas Railroad, necessary for the delivery of chemicals and other supplies, were built for $44,201 by W. H. Nichols & Co. of Dallas.

Another of the big contracts was a $1,339,000 one for construction of filters and a filter building. James C. Williams Inc., of Dallas held that contract. The most complicated job of all was a $737,-145 contract for the chemical building, which the well known Dallas firm of J. W. Bateson Co., Inc., held. Another big one was a $2,137,245 contract for construction of the 54 and 66-inch delivery mains from the plant to Bachman, a distance of 49,000 feet.

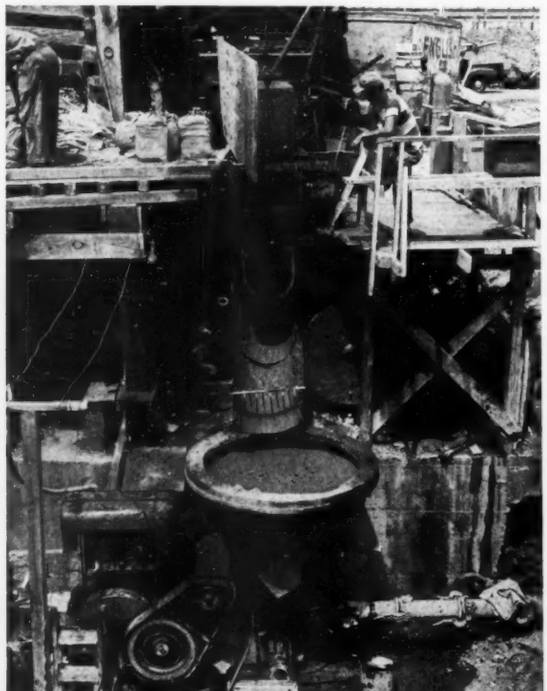
Plant Design

Plant design embodies most modern construction features, without incorporating anything too startling and expensive. The plant is designed to be added to in years to come, as the city's needs increase.

Water enters the plant by double 72-inch intake lines, passing through automatic screens and into the pumping plant. Six pumps lift the water to a rapid-mixing basin at the far end of the plant. Three of these pumps were being installed when the job was visited; each is rated at 33,000,000 gpd at a 55-foot head, and each is driven by a 300-hp motor.

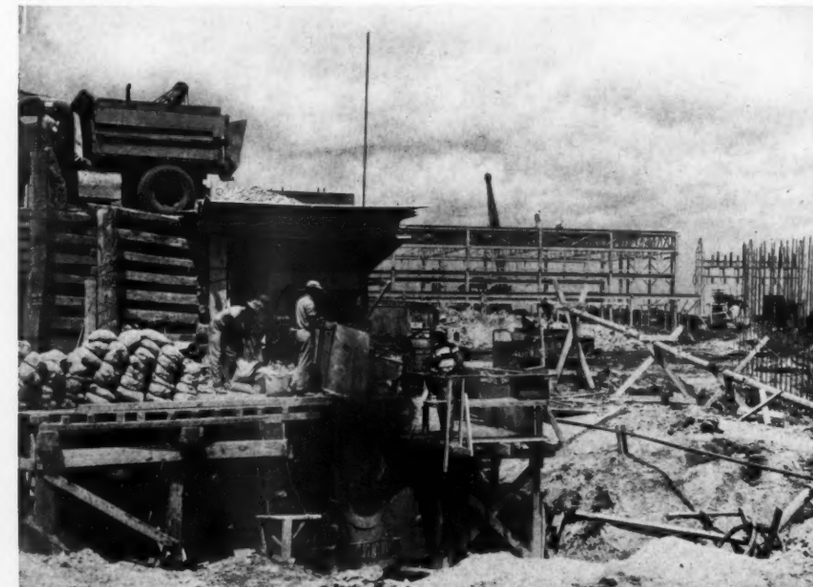
Water then flows back through the plant by gravity. It passes through primary and secondary settling basins, and rapid sand filters. A chemical building adds the various flocculation and purification elements as the water passes through the rapid-mixing basins. From the sand filters, the water passes on to four 187-foot-diameter clear wells for storage. Three 1,750-hp motor-driven pumps, rated at 33,000,000 gpd at 285-foot head, push the water

(Continued on next page)



Another sizable contract was the $1,339,000 one for construction of filters and filter building, held by James C. Williams, Inc., of Dallas. Williams set up a Rex 160-S Pumpcrete directly below a Ransome 16-S mixer to receive concrete (photo at left). Usually the Pumpcrete lines were then laid right to the pours, but for a few odd pours, the concrete was pumped to some fish-tail aggregate trucks (photo below) and hauled to the placement point.

C. & E. M. Photos



from the clear wells toward Dallas. Seven of these large pumps are contemplated in the ultimate stage of development.

The plant is designed for a wide variety of water control. Water can be flocculated twice, if necessary, to precipitate the foreign matter in suspension. At the present time water from Trinity River is an excellent source of raw supply. It comes primarily from an agricultural watershed, and has not been contaminated by industrial wastes.

Foreign matter removed as sludge is deposited in a 52-acre swampy lake across U. S. 77 from the 120-acre plant site. When the sludge settles out, reasonably clear water then re-enters Trinity River.

The sand filter beds have to be backwashed approximately every 40 hours. The wash-water tank is supplied by two 5,000-gpm pumps and one 10,000-gpm pump automatically controlled by a telemetering device.

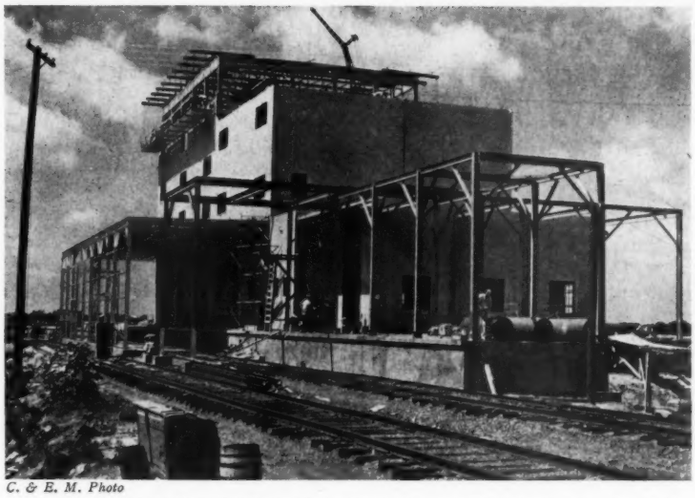
Engineers of the Dallas Water Department stressed repeatedly the use of automatic equipment and labor-saving machinery. There is little for laborers to do around the finished plant. Even the carloads of chemicals which come in to the chemical building are unloaded automatically by Link-Belt feeders and bucket elevators, and stored in separate bins. The wasted sludge involves no further work. The intake structure is automatic and foolproof.

The main expenditure of human effort is by highly skilled chemists, who control the output of water for purity, taste, and softness. No major softening is done beyond the addition of lime. The water is sterilized by adding chlorine just before it passes into the clear wells. Carbon, used for taste and odor control, is added at the pumping station, or at other points as required.

Basins and Underground Work

When CONTRACTORS AND ENGINEERS MONTHLY visited the big multimillion-dollar project, one of the major portions under way was the construction of basins and underground piping by the joint-venture outfit of W. G. Cullum & Co., and Whittle Construction Co. This part of the project included primary and secondary mixing basins, clear wells, and the raw-water lines which lead to the head end of the gravity-flow system in the plant.

The rapid-mix basin is 40 x 55 feet,



C. & E. M. Photo

Perhaps the toughest contract of all was that of J. W. Bateson Co., Inc., for this $737,145 chemical building at the east end of the filtration plant—there were no tolerances at all for carpenters, the mechanical installation had to be so precise.

and is equipped with eight 15-hp rapid-mixer paddles which churn the raw water and mix in the various chemicals, like lime, iron salts, alum, and soda ash. The primary basins are each 380 x 162 feet. Two were being built under the Cullum-Whittle contract, and connections were being installed so a third primary basin could be added some time in the future. Two secondary basins built under this contract are 440 x 162 feet.

The contract included four clear wells, 187 feet in diameter and 20 feet high, of prestressed concrete, with a thin-shell dome roof supported by the prestressing pressure. Prestressing was done not only by winding the outside of the tanks, but the tanks were also stressed up and down by pulling a stress on the vertical stress rods inserted in the concrete.

Underground work under this contract included 600 feet of 24-inch reinforced-concrete pipe, 600 feet of 36-inch pipe of the same material, and

(Continued on next page)

in WIRE ROPE, too it takes the RIGHT KIND of muscle

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COMPLETE WELLPOINT SYSTEMS
FOR SALE OR RENT

New Plant Doubles Dallas Water Supply

(*Continued from preceding page*)

3,500 feet of 54-inch pipe of the same material. These quantities made up the sludge discharge line. The raw-water supply line consists of 1,800 feet of 54-inch reinforced-concrete pipe.

Concrete work in this contract included both flat and circular surfaces, so the contractor figured out a set of forms which could be used on both types. A set of steel forms was designed, and then manufactured to company specifications by the Dallas plant of Wyatt Metal & Boiler Works. The forms were turned out flat for the initial work on basin walls, and when that work was finished, they were rolled to the clear-well radius, minor adjustments were made at the top of each panel, and they were used there.

Cullum & Whittle even cashed in on an unexpected $10,000 break when a sewage-treatment plant was let in Dallas later on. By a design coincidence, the forms also fitted the structures in the sewage plant. With the advantage of having these forms on hand, the company was able to make the low bid on that job.

The forms were fabricated in sections 54 and 48 inches wide, and had flanged ends which permitted the sections to be bolted together to make various heights. Each panel was 9 feet 4 inches in length. Stiffening studs consisted of 2 x 3-inch angle irons welded to the ⅛-inch facing material on 15-inch centers. Extra stiffening was provided by transverse 8-inch channels, one to each 9-foot 4-inch section, which also served as pickup points for the crane which handled the forms.

Ingersoll-Rand electric impact wrenches were used to speed the makeup or take-down process, as the forms were handled. When the forms were used on clear-well construction, 16 complete panels were assembled to cover a little more than 149 linear feet. Eight such pours were required to complete one of the clear-well walls.

Falsework supports for the clear-well domes, only 4 inches thick, ran into extensive carpentry work. For the only way to place these roofs was to support the pours from underneath, and then to dismantle the falsework after the prestressing had been done. Obviously it was not possible to dismantle the falsework in big sections, because every piece had to be taken out through narrow manholes at the base of each clear well. While the falsework could be re-used, many man-hours of carpenter labor were almost inevitable.

The falsework for each clear-well dome consisted of 4 x 4 uprights, set in continuous circles of increasing radius from the center point. Rows of uprights increased in circle diameter about 6 feet between each row. The top of each pair of 4 x 4's was capped with a short piece of 2 x 12, nailed to the side of the 4 x 4 and resting on a lumber scab nailed beneath the lower edge of the cap; 2 x 6 joists were then laid at right angles to the caps, and adjusted to true grade by wedges. Everything was then toe-nailed in, before the lumber sheathing to form the dome was nailed onto the joists.

Cullum & Whittle set up a dry-batch concrete plant on the site, consisting of a Johnson cement silo and a small Johnson manual batch plant. The sand and aggregates were brought in from commercial sources in Dallas. Trinity portland cement was used. The batch plant proportioned the dry batches for concrete, which were then hauled to a 34-E Rex single-drum paver centrally located near the clear-well area. The paver discharged fresh concrete to the receiving hopper of a Rex 160-S Pumpcrete machine, which sent the material out to the point of placement through a 6-inch delivery line. Workmen with shovels and vibrators helped to distribute and consolidate the material. The maximum pumping distance on this contract was about 450 feet.

C. & E. M. Photo

Carpenters erect falsework for the thin-shell dome roof of a clear well on the Cullum & Whittle joint-venture contract

Concrete delivery on the clear-well walls was made by swiveling the Pumpcrete line at the center point, and carrying the delivery segment on three sets of rubber-mounted dollies. The pipe thus had a constant radius, and could make one of the 149-foot pours at one setting. A small pouring hopper was used at the end of the line.

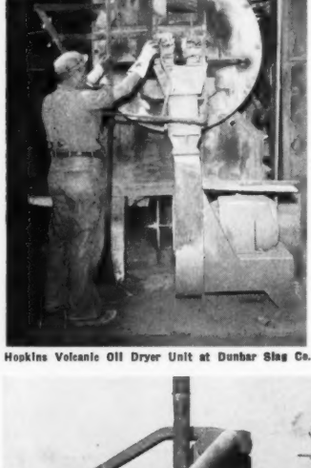
E. H. Moss, General Superintendent, ran field work under this contract, and George Cason was Project Engineer.

Filters and Filter Building

Construction of filters and a filter building by James C. Williams, Inc., represented one of the sizable portions of the project. Under this contract, 24 filters were built.

Filter beds are 36 x 42 feet each, and contain a graded sand and gravel filter medium totaling about 4 feet in thickness. This filter medium ranges in size from 2½-inch to 100-mesh, with the finer material at the top of the bed. Each filter bed handles 4 mgd, at a filtering rate of 2 gallons per square

(*Continued on next page*)



Hopkins Volcanic Oil Dryer Unit at Dunbar Slag Co.

AT THE
DUNBAR SLAG CO.
SHARON, PA.

"HOPKINS UNITS Give us a DRIER HEAT··· Less Fuel Consumption"

• Shown at the left (below) is a large Tandem Dryer Asphalt Plant, using two Hopkins Volcanic Dryer Units which were installed three years ago. These units replaced old-style steam atomizing burners, which actually added extra moisture, thereby presenting additional problems. Mr. Karl Dunbar says, "We now get a much better drying job than before. Hopkins units give us a drier heat . . . less fuel consumption, and better temperature control."

Other contractors, too, have reported excellent results with Hopkins units — have found that Hopkins equipment steps up production, provides greater efficiency, and reduces fuel cost. Why not get these cost-cutting, time-saving features for *your* asphalt plant? A letter or phone call will bring you descriptive literature and complete details.

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Showing complete plant with dust elevator and dust collection unit

- Capacity—100 tons per hour guaranteed (based on 5% initial water content, dried to within ½ of 1% and heated to 350 to 400 degrees Fahrenheit).
- Mixing tower with vibrating screens and mixer.
- Enclosed cold and hot elevators.
- Equipped with cold storage bin and feeder.
- Internal combustion with low pressure burner equipment.
- Dust collector discharging reclaimed dust into hot elevator.
- Power—diesel or electric.
- Plant is complete with all motors and starter switches.

Other sizes from 50 to 100 tons per hour (complete drying and mixing units) available.

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Builders of Fine Asphalt Plants
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ot per minute.

The filters themselves are not covered, but the filter building is a covered, enclosed, reinforced-concrete structure which can handle water purification winter and summer.

Forming methods were conventional on this contract. The form panels were prefabricated in a central yard nearby, where power saws were located to make easier the job of cutting lumber to size. The panels were formed by nailing plywood facing to 2 x 4 studs, doubling the 4's for use as wales, and holding the forms together with Universal patented snap ties. Under the floor and roof slabs of the filter building, ordinary 4 x 4's were used as shores.

Materials which made up the concrete mix were hauled in from a commercial plant in Dallas, and dumped direct to a 2-bin Johnson manual batch plant. The materials were weighed and dumped to the skip of a Ransome 16-S mixer. Trinity sack cement was also added at the mixer skip. Mixing water was piped in from a local source of supply. The fresh concrete was then dumped out of the mixer to the gob hopper of a Rex 160-S Pumpcrete machine, which was located in a hole below the mixer.

As a general rule, Pumpcrete lines were then laid to the various pours. Where were a few odd pours, however, where it was more economical to Pumpcrete the concrete a short distance to a few fish-tail aggregate trucks, and haul it to the point of placement. A 1-yard Blaw-Knox bucket and a Model 5 Northwest crane were available for these odd pours.

Installation of the filter material was one of the most tedious parts of the Williams operation. The layers were each so thin and precisely placed that mechanical handling was almost impossible. Filter material, originating in a commercial rock plant at Texarkana, came in to the M.K.&T. spur by rail. A Northwest clam unloaded about three cars a day, bucketing the material to five dump trucks with special welded fish-tail dump gates. The trucks then brought it to the top of a timber ramp at the site, and dumped it into CMC concrete buggies. A labor crew under the strict supervision of a city inspector then placed the material.

Unexpected ground water was found in many parts of the filter project, but the contractor's men dug small sumps and training ditches, and removed it with small gas-driven pumps. This job made good progress under the field supervision of Wayne C. Smith.

Chemical Building: the Toughest

By far the toughest and most unusual part of the project, according to its builders, was the chemical building at the east end of the filtration plant. Experienced construction men had to scratch their heads over many of its details, because it resembled no building they had ever before tackled—for a reason.

The reason is that the building is really a chemical-plant installation, and the construction of the building shell was strictly a secondary operation. So precise was the mechanical installation that there were no tolerances for carpenters. Because the designers had to design supporting columns anywhere they could to make them fit around the bulky chemical bins and feeding equipment, all floors of the 5-story building contain a veritable forest of columns, no two of which are in line.

"Thank God for the most cooperative subcontractors I've ever worked with," said General Superintendent Johnny Roberts, director of operations for J. W. Bateson Co., Inc., builder of the $737,145 structure. "Without their help and cooperation we'd still be worrying about the foundation."

The chemical house is a 5-story affair, of beam-and-slab reinforced-concrete construction, with an outside structural-steel framework to support a roof over the railroad dock. The roof for this dock is of precast-concrete slab design.

Glazed and semiglazed tile forms the interior of the building. The exterior is of yellow bricks. All floors but the fifth are accessible by elevator.

E. E. Farrow of Dallas did all mechanical installation in this building, along with plumbing, heating, and ventilating. Superior Electric Co. had the electrical subcontract. D. W. Morris did the masonry work—tile setting, bricklaying, and so on. F. B. McIntyre set the huge steel tanks and structural steel. The tanks were furnished by General Steel Co. of Fort Worth.

Miscellaneous steel was furnished and delivered by Austin Bros., Inc., and the Dallas firm of Davis Bros. had the painting contract. George Rackle furnished the outside precast slabs, and Dougherty Roof Co. had the subcontract for all roofing and sheet-metal work.

(*Concluded on next page*)

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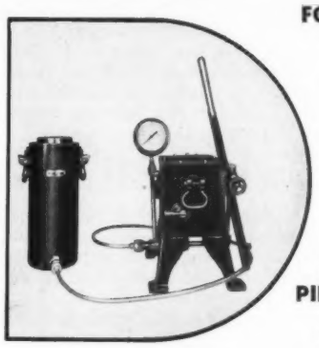

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Hetherington & Berner Announces the

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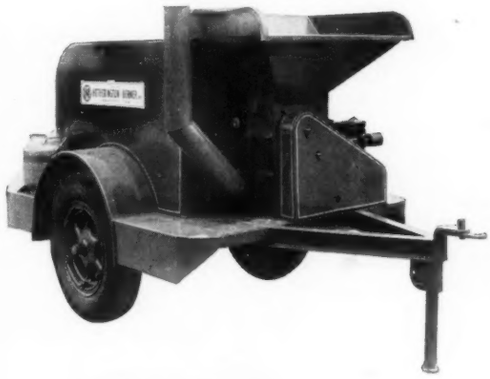
for speedy, low-cost patching



• The Moto-Patcher is a mobile mixing unit designed for faster, more economical maintenance work on roads and streets. It is also well adapted to use on driveways, parking areas and similar small construction and maintenance jobs.

The Moto-Patcher is simple and inexpensive to operate. Aggregate may either be shoveled into the hopper or fed into the hopper by a small elevator (optional equipment) as shown at the lower left. The mixed material is deposited on a pan of convenient height for easy shoveling, or it can be dropped directly onto the road surface.

SPECIFICATIONS

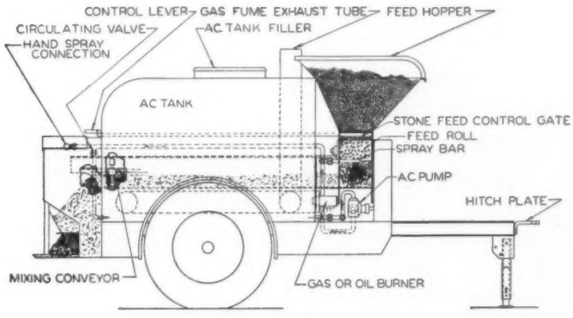
(Standard Equipment)

Mixing Capacity, Max., 10 tons per hour
Tank Capacity, 400 U. S. Gallons
Tank Heater, bottle gas burner (bottles not furnished)
Engine, Briggs & Stratton Model 23 R6
Bearings, Fafnir anti-friction
Pump, Viking Model H-117, 10 GPM
Tires, 7:00-20, 8 ply
Overall length, inc. tongue, 11′ 10″
Overall width, 5′ 10″
Overall height, empty, 5′ 11″
Net weight, empty, 2700 lbs.

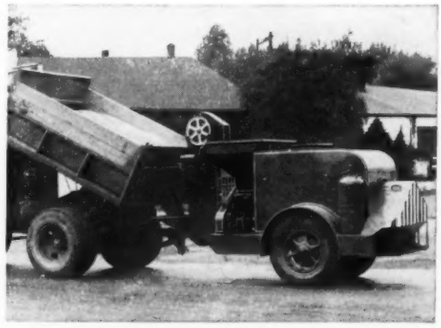
(Optional Extra Equipment)

Kerosene burner (in place of gas)
Feed Elevator with individual Briggs & Stratton engine
Hand spray and hose

***Note:* Specifications subject to change without notice**



Moto-Patcher Flow Diagram



Elevator to feed Moto-Patcher from truck, without shoveling. (Optional equipment)

The Moto-Patcher will deliver up to 10 tons per hour of freshly mixed material. The 400 gal. tank assures an adequate supply of bitumen for uninterrupted production, making frequent stops unnecessary. The tank may be heated by either bottled gas or kerosene. The mixer, running through the heated bitumen tank, gives a drying effect to the aggregate. Front and rear connections are provided for hand spraying.

For complete information see your local H & B distributor, or write direct.

HETHERINGTON & BERNER INC.
Engineers—Manufacturers
731 Kentucky Avenue Indianapolis 7, Indiana

New Plant Doubles Dallas Water Supply

(Continued from preceding page)

Possibly the only stroke of good fortune which Johnny Roberts enjoyed was the fact that the basement floor of the building was approximately at natural ground level, so no excavation was necessary. The ground around the chemical building was built up by spoil dirt from the excavations at the pumphouse and filter beds. There was, however, a pile-driving job involving 301 Raymond step-taper cast-in-place concrete piles.

Raymond Concrete Pile Co. made this installation with one of its smaller rigs. The piles were driven about 28 feet deep to develop 30 tons of bearing each. Bearing for each shell was calculated at the hammer, and one actual load test was made, which checked the hammer information nicely.

So far as the construction of the building was concerned, the best way to describe it is to call it a headache from start to finish. Because of after-pour shrinkage, the columnar concrete had to be placed in advance of the floor slabs above it. The columns usually set about 72 hours before the floor slabs were placed. One slab had a greater volume of electrical conduit than of concrete!

Ordinary plywood and shiplap facing was used in the construction of form panels, with plywood in all exposed places. The continuity of work was so complicated that Roberts once had an 8 x 18-inch concrete beam, resting on slender 12 x 12-inch columns, 23 feet in the air. High winds howled through the building skeleton, and the beam began to sway and twist.

"I knew the designers knew what they were doing, but just the same I got scared and went up there and put on some guy wires to tie her down", Roberts said, grinning.

Roberts mixed his concrete materials, which came in from a commercial source in Dallas, in a 14-S Jaeger mixer. Two hoisting machines were available to send it up to where it was needed. There was a General crane with 100 feet of boom and a 15-foot jib, and a wooden tower with a Le Roi-driven Domestic hoist. As a general rule each floor-slab form was placed as soon as possible and concrete even for the columns was buggied to position.

So far as Roberts could remember, it was impossible to re-use a single form. Nothing was typical. When a pour had been completed, carpenters and workmen stripped the forms and carted them away for burning.

Slowly but surely the building took shape. Day by day, mechanical experts measured and remeasured with steel tapes. Clearances were checked and rechecked. So corrosive is the chemical flocculation slurry, for example, that all the pipes were lead-lined and fabricated to exact dimension. There was no room either for error or tolerance. Harried carpenters, used to thinking in terms of a quarter of an inch, had to set their sights a whole lot finer. Whoever hires those carpenters on his next job will probably think he's employed a gang of fussy old women when they start to measure.

Installation of equipment kept pace pretty much with construction of the building shell. Link-Belt car-unloading and conveying equipment was installed. The big chemical tanks were welded together. Mixers, beaters, and other such equipment went in. Day by day the remainder of equipment arrived to complete the installation.

By early autumn, the first units of the Elm Fork plant were ready for operation, and Dallas, Texas, can now go right ahead and develop, so far as the Water Department is concerned. For the capacity has been doubled, and the Department is ready for anything foreseeable up to 1970.

Personnel

Design and supervision of the big water plant was under K. F. Hoefle, Superintendent of the Water Department. J. D. Winder was Chief Engineer, and L. W. Cumber, Resident Engineer on the project.

Push-Button Weight Control

A 4-page folder on push-button weight control, providing one standard-size automatic scale for controlling up to 36 weighing operations, has been prepared by Hardy Scales Co., 5701 S. Atlantic Blvd., Maywood, Calif. It points out that the Hardy automatic batch control is made up of two units: the selector cabinet and the control cabinet. It illustrates each and gives complete information on how it works.

The literature points out that there is practically no limit to the weight, size, or substance of material that can be handled. After the weighing operations are set, the push-button electronic controls will open and close a gate or valve, stop and start a screw, operate feeders, motorized conveyors, elevators, or whatever type of conveyor is in use to carry material to the weigh hopper or tank scale. The materials may then be weighed in any manner desired.

The control of the unit has a timer that permits the timing of a weighing or mixing operation. It also contains counting and printing devices for setting the number of batches to be weighed automatically and printing the weights for accurate record-keeping. The folder briefly cites the applications for this unit in the construction industry.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 164.

STA-VIS STARTING FLUID

Auxiliary Fuel for Quick Starting of Diesel Engines

- Prolongs battery life
- Sure fire starts
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LARGE 24-OUNCE CAN ONLY $1.20

25-can case shipped prepaid

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HERE'S WHAT USERS SAY ABOUT THE DEMPSTER-DIGGSTER—

"IT'S THE FASTEST, MOST EFFICIENT EXCAVATING TOOL I HAVE USED"

—A. J. METLER, *Contractor*

"During the past several years," Mr. Metler says, "I have owned and operated four conventional full revolving crawler and truck mounted shovels and cranes and know that they have a direct application to many types of excavating work.

"On the other hand, I have learned that the fast operation of the tricycle mounted Dempster-Diggster permits it to be used on certain types of work to a considerable advantage. Its mobility permits quicker transfer from one job to another.

"I have had excellent results from the Dempster-Diggster and consider it the fastest and most efficient excavating tool I have used."

Mr. Metler is one of the many contractors who has found the Dempster-Diggster to be "the fastest and most efficient excavating tool" available.

This speed and efficiency in excavation work is accounted for, mainly, by the Diggster's exclusive independent hydraulic crowd and hoist action, its hydraulic steering and wheel-type traction.

The power crowd permits bucket to keep digging until loaded . . . no digging with wheels. The hydraulic steering gives the driver sensitive, easy, finger-tip control. When accelerated, a one-handed twist of the steering wheel puts the machine in any desired position. By operating on rubber-tired wheels, the Diggster, of course, can move at the fastest possible speed on the job and to and from jobs.

The Type HL Dempster-Diggster is equipped for extraordinary high dumping. The bottom of bucket is 13 feet six inches above ground.

HERE IS THE NEW TYPE HL DEMPSTER-DIGGSTER shown excavating with a 1¼ cu. yd. (heaped) digging bucket. The Type HL Dempster-Diggster will dig through an 18 foot bank while the Type GRD digs through a 15 foot bank.

The Dempster-Diggster is a "must" for contractors, large or small operators alike.

The Dempster-Diggster has a 15 foot turning radius, is 20 feet long when bucket is in traveling position, and is nine feet and six inches in height.

Four standard interchangeable buckets of two types are available. Digging buckets with four bottom teeth in 1 and 1¼ cubic yard (heaped) capacities, and materials handling buckets in 1½ and 2 cubic yard (struck) capacities.

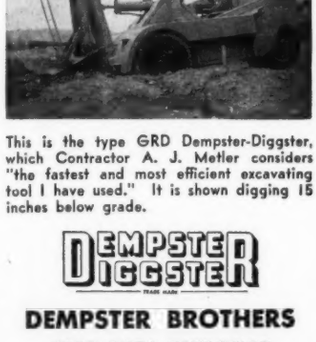
For fast, efficient operation in difficult terrain, the Diggster is available with crawler-type traction.

"I have not personally used the Dempster-Diggster mounted on crawler treads," Mr. Metler said, "but have seen it in operation on jobs adjacent to mine. I know it is a very effective tool and has many applications."

Construction men have found that on big jobs the Dempster-Diggster has no equal for working in tight places and for freeing big shovels for heavier work. The Diggster has an 8 foot 10 inch crowing reach, will dig through a 15 foot bank, and will dig 15 inches below grade.

Pound for pound, the Dempster-Diggster will out dig and out load any other available competing machine in tough going! Let us prove that statement!

Write today for complete information and prices. The Dempster-Diggster is a product of Dempster Brothers, Inc.



This is the type GRD Dempster-Diggster, which Contractor A. J. Metler considers "the fastest and most efficient excavating tool I have used." It is shown digging 15 inches below grade.

DEMPSTER DIGGSTER

DEMPSTER BROTHERS

4121 SHEA BUILDING

KNOXVILLE 17 TENNESSEE

A ⅜-inch-capacity geared chuck is standard on the Cummins Model 115 drill. So is a swivel side handle for 2-handed operation.

Two-Handed Drill

A new drill with a ⅜-inch chuck and swivel ball side handle for two-anded operation is announced by Cum-ins Portable Tools, 4740 N. Ravens-ood Ave., Chicago 40, Ill. The Model 15 weighs 4¼ pounds. Its recom-ended capacity, the company says, is inch in metal, ¾ inch in hard wood. Further information may be secured om the company. Or use the Request ard at page 16. Circle No. 182.

Steam-Jet Cleaner

A steam-jet cleaner for machine tools nd equipment has been announced by ivingstone Engineering Co., 100 Grove t., Worcester 5, Mass. The Speedylec-ic Model JC-25 operates at pressures p to 200 psi. The combination of this ressure and the new Speedylectric win-jet steam lance, with finger-tip ontrol, is designed to give powerful leaning action. The JC-25 is 16 x 48 nches and is designed for portability in ose quarters. It is completely self-con-ained, and space is provided on the all-teel truck to mount a water tank of ufficient capacity for 3 to 4 hours of ontinuous operation, the company ays.

It uses steam from the built-in high-ressure Speedylectric boiler, and is ree of low-water danger. The boiler ater itself is the electric-resistance eating element, and if there is no ater, no current passes and no steam generated. The boiler is available for 20, 440, or 550 volts. Rated at 20 kw, consumes 15 kw per hour under rdinary operating conditions.

Further information may be secured om the company. Or use the Request ard at page 16. Circle No. 208.

M-C&S Report Wins Oscar

The "Oscar of Industry" is a bronze rophy awarded each year by the Fi-ancial World Survey of Annual Re-orts to the construction firm having he best annual report. This year—the leventh in the program—the inde-endent board of judges awarded the Oscar, for the second consecutive year, o Merritt-Chapman & Scott Corp., lew York, N. Y., which is active in in-ustrial, building, marine, and heavy onstruction, marine salvage, and eavy hoisting.

The M-C&S report was chosen from total of 5,000 annual reports, all of hich were judged in 100 industrial lassifications. M-C&S dedicates its re-ort to the men on the job, and a fore-ord pays tribute to their skill, ex-erience, and loyalty. The report is oncise and interesting, printed in col-r, and illustrated by photographs of he various projects under way during he year. It sets forth clearly the finan-ial position of the company, and de-otes a section to each department of he firm.

This year, as last, Morrison-Knud-en Co., Inc., placed second, and Lane-Wells Co. placed third. The trophy-giv-ing took place at the Annual Awards Banquet in the Grand Ballroom of the Hotel Statler, New York, on October 29, with Weston Smith, originator of the annual report surveys, making the presentations. Raymond F. Kopp, President and Treasurer of Merritt-Chapman & Scott Corp., received the Oscar on behalf of his company.

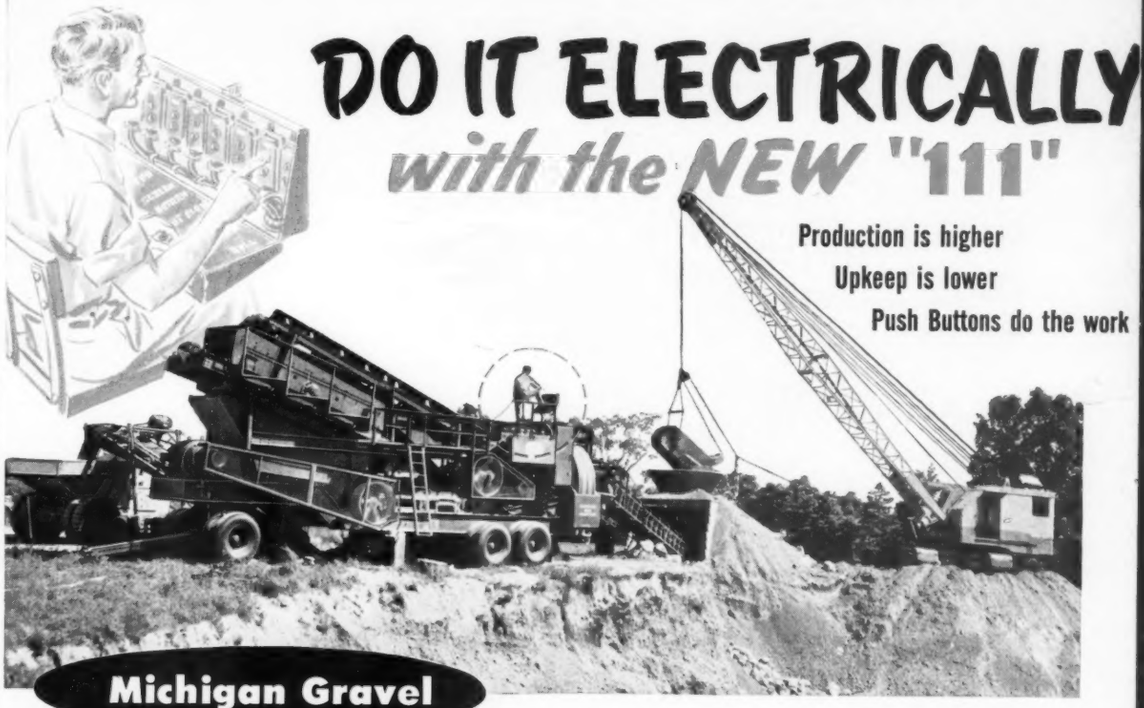
Effects of $CaCl_2$ on Cement

A 40-page booklet, "The Effects of Calcium Chloride on Portland Cement", is available from the Solvay Sales Division of Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y. It answers clearly and concisely many questions that arise concerning the use of calcium chloride in cement. It discusses acceleration of set, early strength, curing, ultimate strength, workability and density, resistance to wear, and volume change. It considers the use of calcium chloride with special cements: air-entraining, high-early-strength, and low-heat. It also treats special effects, as in dry mixes, colored concrete, and mortars and stucco.

A large portion of the booklet is devoted to technical abstracts and references. Charts and diagrams illustrate each point of the discussion. The booklet closes with a list of 22 questions most commonly asked regarding the integral use of calcium chloride in portland cement, and their answers.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 145.

"Gosh! You'd think his arms'd get tired holdin' that blueprint all day."



DO IT ELECTRICALLY
with the NEW "111"
Production is higher
Upkeep is lower
Push Buttons do the work

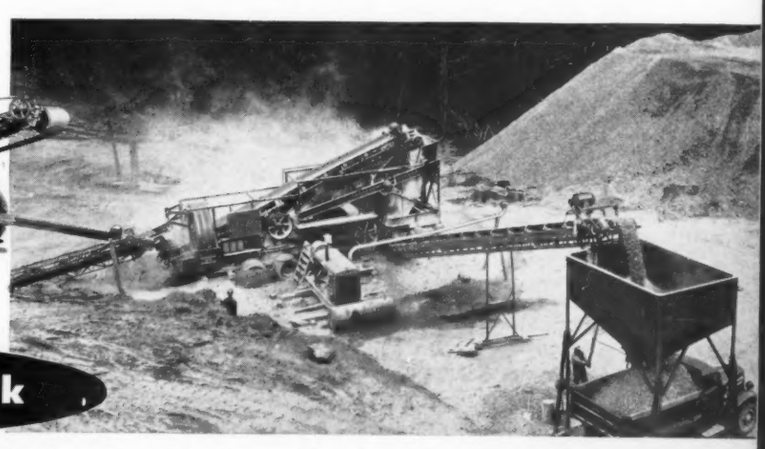
Michigan Gravel

Production is higher—because each unit has its own electric motor drive; thus operates at top speed and efficiency at all times.

Upkeep is lower—because drives are simple and have few parts.

Push buttons do the work—the man on the platform starts and stops the feed and delivery conveyors, and has other units under complete control.

Primary Breaker units are made in several sizes; this one has a 3' x 10' apron feeder, 20" x 36" jaw crusher, power unit and delivery conveyor—all mounted on pneumatic tires.



Carolina Rock

The high production "111," with its 10" x 36" jaw and 40" x 24" roll crushers, is equally at home in gravel and rock. On this quarry job, production is still further increased by using a Primary Breaker unit with 32" x 40" jaw crusher (not visible in the photograph) to reduce the oversize to about 5 inches.

AUSTIN-WESTERN COMPANY · Subsidiary of Baldwin-Lima-Hamilton Corporation · AURORA, ILLINOIS, U.S.A.

Austin Western

BALDWIN BLH LIMA-HAMILTON

SINCE 1859—BUILDERS OF CONSTRUCTION EQUIPMENT

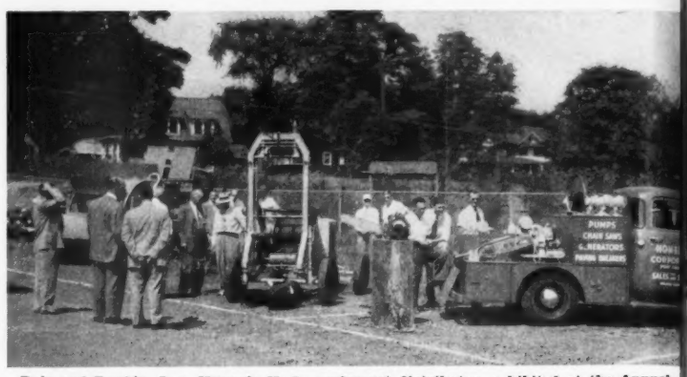
Distributor Doings

Inter-Regional AED Conference

By BEAL SHAW, Director, Region 11

Equipment distributors from the eleven western states and Canada met in inter-regional conference at Sun Valley Lodge, Sun Valley, Idaho, on October 12 and 13. The regions represented were: Region 11, composed of California, Arizona, Hawaii, and Nevada; Region 12, embracing Washington, Oregon, Montana, and Idaho; Region 14, made up of Colorado, Wyoming, Utah, New Mexico, and the vicinity of El Paso, Texas; and Region 15, which includes Canada. During the two-day session a great deal of business was discussed, but members and their wives also found time to relax and take full advantage of the pleasure facilities available at this well known Idaho resort.

One of the questions of policy highlighted at the meeting was that of advertising. F. B. McBath introduced the subject with a talk entitled "Should Distributors Participate in Cooperative Advertising Campaigns?" In the discussion which followed, all speakers agreed that the manufacturer should carry the load of national advertising, but that the distributor should take care of local advertising. Program Chairman A. F. Sersanous, of Loggers & Contractors Machinery Co., Portland, Oreg., pointed out that the eleven western states plus the Territory of Alaska formed far too large a construction market to be classified as a "regional" market. Members of these states, he said, were opposed to being included under cooperative advertising plans. He moved that members representing these states urge manufacturers advertising there to eliminate cooperative advertising. The resolution was unanimously adopted.



Dale and Rankin, Inc., Newark, N. J., equipment distributor, exhibited at the Annual Meeting of the Metropolitan Section, American Public Works Association, held recently at Ridgewood, N. J.

Other subjects discussed by various speakers were: "Service Obligations of the Distributor and Manufacturer" by A. F. Garlinghouse, Garlinghouse Bros., Los Angeles; "What's Ahead in Washington?" by H. J. Hush, Executive Vice President of AED; and "Let's Do Something About It" by Jack Hatton, Star Machinery Co., Seattle. Mr. Hatton's talk included such subjects as rental, overlapping lines, freight consolidation, trade-ins, maintaining individual prices, and the relationship between dealers who are AED members and those who are not.

"The Survival of the Equipment Distributor" was the subject of a talk by C. M. Weinberg, President of Brown-Bevis Co., Los Angeles. James I. Ballard, Vice President of Western Construction, San Francisco, chose "A Long-Range View of Construction in the West" as his theme. Mrs. Marjorie Creim, Secretary-Treasurer of Bow Lake Equipment Co., Seattle, spoke on "The Customer, Our Capital Asset".

As regards the AED membership and affairs, R. L. Arnold, of Salt Lake City, President of AED, introduced the discussion with a talk which touched on the growth of the Chicago meeting and a possible move back to Washington, D. C. It was, however, generally agreed that there is no substitute for Chicago as national headquarters.

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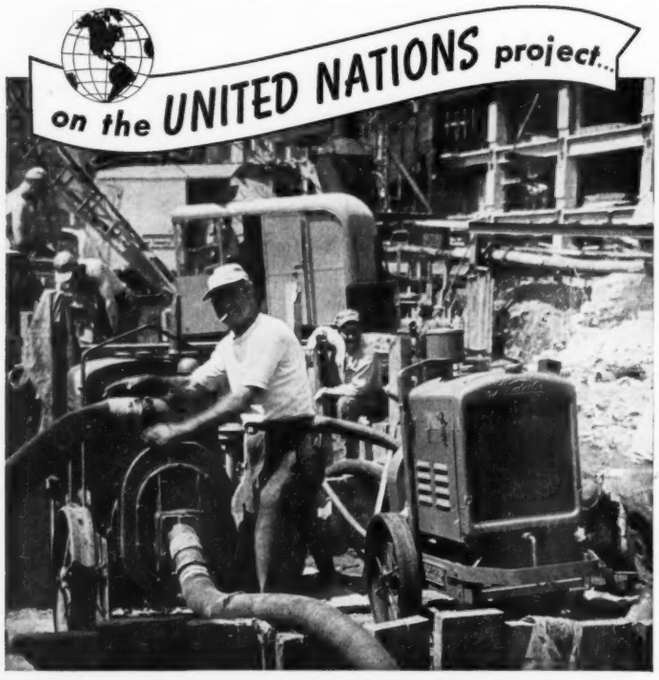


WAUKESHA

POWERS the PUMPS

Waukesha FCU Power Unit —4-cylinders, 3¼-in. bore x 4-in. stroke, 133 cu. in. displ.

● So that the contractors may constantly keep the jump on the job, you find Waukeshas keeping on steadily and sturdily, putting out the power for the pumps. Here, it's the United Nations construction project in New York; Fuller-Turner-Walsh-Slattery are the contractors. These are Marlow 421-2 self-priming centrifugal pumps, with Model FCU Waukesha Power Units, because dependable pumps demand equally dependable power.

Structurally rigid, with moving elements finely balanced, the FCU is smooth and responsive. Crankcase-cylinder block is one unit. Drop-forged extra large crankshaft has three 2⅛-in. bearings. Pressure oiled, pump-cooled, has built-in centrifugal governor; controlled turbulence combustion for extra power on less fuel. Send for Bulletin 1498.

153

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN

NEW YORK TULSA LOS ANGELES

How OLD is Santa Claus?

This particular Santa—the one you see on the Christmas Seals—is a very healthy forty-five!

Yes, this is the 45th annual Christmas Seal Sale—a holiday custom that has helped save 5,000,000 lives. Yet, tuberculosis kills more people than all other infectious diseases combined.

So, please, send your contribution today.

BUY Christmas Seals!

★ ★ ★ ★

LUBRICATION ECONOMY

"LUBRIPLATE Prevented Parts Replacements and Tie-ups"

After clearing 500 acres of salt marsh for the Leslie Salt Company, J. O. Archibald, contractor of Redwood City, California said, "*LUBRIPLATE kept equipment rolling in mud, muck and water.*" You may never have an earth-moving job like this to do, but if you turn a wheel in any industry, you can profit by Mr. Archibald's experience.

1. LUBRIPLATE reduces friction and wear
2. LUBRIPLATE prevents rust and corrosion
3. LUBRIPLATE is economical to use

Write today for case histories of savings made through the use of LUBRIPLATE in your industry.

LUBRIPLATE DIVISION
Fiske Brothers Refining Co.
Newark 5, N.J. Toledo 5, Ohio

The Different LUBRICANT!

DEALERS EVERYWHERE, consult your Classified Telephone Book

Large windows with extruded-aluminum frames give an unobstructed daylight view in Garlinghouse Bros.' new display room. The tilt-up method of concrete construction was used for the building.

September 28 was an all-day open house for Garlinghouse Bros. Guests admired the 90,000 square feet of additional sales and display space.

here was also some discussion re-rding the purchase of a headquarters ilding near the Drake Hotel in icago, and the increase in member-ip dues which was voted recently by e active AED membership.

Region 12 made the arrangements r this meeting. Working with Program airman Sersanous, Phil Dufford of termountain Equipment Co., Boise, aho, was Chairman of the Arrange-ents Committee, and L. E. Jones, gion 12 Director, acted as General airman of the meeting.

oehring Appoints Indiana Dealer

The A. F. Deaney Co., 719-21 N. Pine , Indianapolis, Ind., has been ap-inted exclusive distributor for the oehring Co. of Milwaukee, Wis., man-acturer of heavy-duty construction uipment. The firm also represents C. Johnson Co. of Champaign, Ill., and rsons Co. of Newton, Iowa, both oehring subsidiaries.

The line now handled by Deaney in-udes Koehring excavators, cranes, aglines, Dumptors, pavers, finishers, ud-Jacks, and construction mixers; hnson aggregate and cement plants, tchers, bins, storage silos, clamshell d concrete buckets; and Parsons awler and rubber-mounted Trench-ers.

arlinghouse Opens New Building

An all-day open house on September inaugurated the new offices and dis-ay room of Garlinghouse Bros. at 15 E. Washington Blvd., Los Angeles, alif.

Distributor of many nationally known akes of construction and industrial uipment, Garlinghouse also has two anufacturing subsidiaries — Gar-Bro fg. Co., which makes over 200 differ-t concrete-placement items; and Gar-o Wheel Co., manufacturer of wheels.

The firm plans an expanded service d greater cooperation with its cus-mers through the use of the new les office and showroom. The de-gner of the 2-story building used the w tilt-up method of concrete con-uction with red-brick face trim. rge plate-glass windows with ex-uded-aluminum frames permit a full ylight view of the construction ma-chinery on display. Also, ten private offices and two general offices are contained in the 90,000-square-foot floor space, together with special offices such as a design and drafting room, an advertising office equipped for direct-mail handling, a film-projection room, and a sales-conference room.

Founded in 1923, Garlinghouse at that time consisted of A. F. Garling-house, L. H. Garlinghouse, and one secretary. Now, by a series of ex-pansions, the firm has nearly 100

(Continued on next page)

ENGINEERED TYING DEVICES, ANCHORAGES and ACCESSORIES for CONCRETE CONSTRUCTION

RICHMOND TYSCRUS OUT-PERFORM THE CLAIMS WE MAKE FOR THEM

There's complete protection for you and the job you're delivering— in the unusually wide margin of safety provided by Richmond's rating of its form-tying products. Independent Tests* show TYSCRUS capable of withstanding loads well over 50% more than Richmond's own "Safe Load Rating" for these devices. This has contributed to a record of safe performance by Richmond Products on Heavy Construc tion Jobs for more than 20 years.

TYSCRU SIZE	PUBLISHED SAFE LOAD	REPORT OF ULTIMATE LOAD Test No. 1	Test No. 2
½" Dia.	6,000	9,490 lbs.	10,590 lbs.
¾" Dia.	12,000	19,720 lbs.	20,570 lbs.
1" Dia. 2 Strut	18,000	27,580 lbs.	27,820 lbs.
1" Dia. 4 Strut	24,000	37,930 lbs.	36,890 lbs.
1¼" Dia. 4 Strut	30,000	55,270 lbs.	56,790 lbs.

*Conducted at Brooklyn Polytechnic Institute by Charles E. Schaffner, Asst. Professor of Civil Engineering

THERE Y'ARE PAL— I GUESS THAT'LL HOLD YER.
SURE SHOULD—LOOKS LIKE YOU'RE AIMING FOR THAT EXTRA MARGIN OF SAFETY THE OLD MAN SAYS MAKES RICHMOND PRODUCTS THE BEST BUY THERE IS.
SCREWY
INSIST ON RICHMOND
... AND BE SURE IT'S RICHMOND!
Richmond
SCREW ANCHOR CO., INC.
816-838 LIBERTY AVENUE · BROOKLYN 8, N.Y.

Get your "Screwy" or "TY" button—write to Tom Killen at Richmond, 816 Liberty Ave., Brooklyn 8, N. Y.

RICHMOND KNOW-HOW—DEPENDABILITY—SERVICE—ESTIMATES & JOB PLANNING

USE RIGHT BUCKET FOR THE JOB

Hayward makes all three — clam-shell, electric motor, orange peel. A Hayward recommendation is unbiased.

Trade HAYCO Mark

THE HAYWARD CO., 32-36 Dey St., New York

Hayward Buckets

Distributor Doings

(*Continued from preceding page*)

employees. The personnel, consisting of well trained men with extensive experience in construction, is headed by two partners: A. F. Garlinghouse, whose jobs have included those of Resident Engineer of the California State Highway Commission, Sales Manager of a Pittsburgh equipment firm, and Director of the Associated Equipment Distributors for Region XI; and his brother, L. H. Garlinghouse, who served 12 years in the Engineering and Sales Division of the Blaw-Knox Co.

Two Oregon Dealers for Kue-Ken

Straub Mfg. Co., Inc., Oakland, Calif., announces the appointment of two new distributors in the state of Oregon for its Kue-Ken crushers. The dealers are Cal-Ore Machinery Co., Inc., 944 South Central Ave., Medford; and Edward L. Kropp Co. (formerly Western Road Machinery Co.), 1415 S. E. 8th Ave., Portland.

Thew Distributor Service School

A new type of training-school program for Lorain distributors' service men has been inaugurated by The Thew Shovel Co., Lorain, Ohio. Instead of a relatively large group of men sitting for hours in a classroom listening to lectures and looking at pictures, the Thew 2-week classes consist of no more than four men with all of their time spent in the various Thew plants. A Thew service engineer heads each group, and as the students watch and participate in the assembly of the equipment, this engineer is constantly on hand for questions and demonstrations of servicing technique.

Distributor service men attend Thew Shovel Co.'s new training school in groups of four. A Thew service engineer heads each group.

The course is popular with both men and distributors, because of the practical value to a service man who can ask questions at any time, get an actual demonstration of the problem under discussion, and learn by doing.

Canadian Dealer Modifies Name

Bingham & Hobbs Equipment Co., Ltd., 395 W. 5th Ave., Vancouver, B. C., Canada, has changed its name to Bingham Equipment Co., Ltd., retaining the same address. The change was brought about by the withdrawal of P. A. D. Hobbs from his partnership with P. E. Bingham, in order to form his own company (P. A. D. Hobbs & Co., Ltd.) and become an agent for Greening wire rope. Bingham Equipment Co., with P. E. Bingham as President and Managing Director, continues to handle Mall power chain saws, Trojan fairleads. Climax conveyor chain, Klamath Locomotive & Machinery sawmills, Viceroy cylinders, Lawrence winches and fork lifts, Simonds saws, etc.

Dealer Keeps Up With Texas

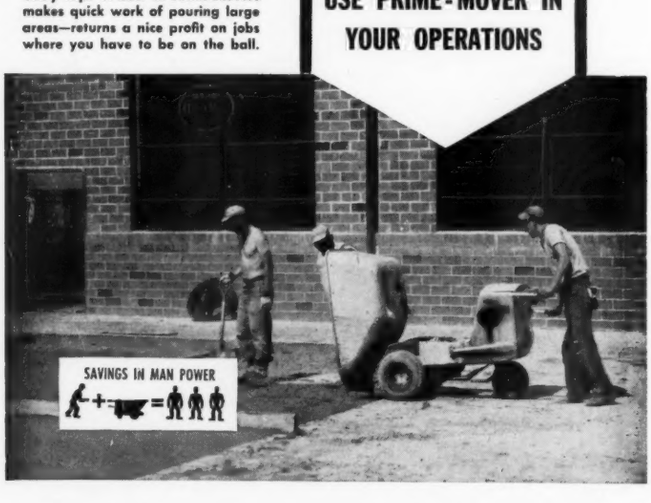
Anyone who sets out to keep an eye on the various industries of Texas has a job ahead of him. In the case of Browning-Ferris, this means supplying and servicing heavy machinery for oil-well drilling, pipeline laying, road building, land-clearing, and the construction and operation of refineries and natural-gas processing and chemical plants. Small wonder that *Big*, published by the Goodyear Tire & Rubber Co., carried a full story on this lively outfit in its Vol. 7, No. 3 issue.

Browning-Ferris Machinery Co., Dallas and Houston, has distributed and serviced construction and material handling equipment for Texas for the past 38 years and is the nation's oldest

(*Concluded on next page*)

THIS IS THE WAY TO USE PRIME-MOVER IN YOUR OPERATIONS

The Prime-Mover and one man dumps 1500 pounds of concrete every trip. A fleet of Prime-Movers makes quick work of pouring large areas—returns a nice profit on jobs where you have to be on the ball.

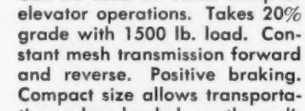


Profitable — from basement to top floor!

Powered by a dependable 5 H.P. Wisconsin engine the Prime-Mover puts in a full day's work. Can be used on either ramp or elevator operations. Takes 20% grade with 1500 lb. load. Constant mesh transmission forward and reverse. Positive braking. Compact size allows transportation, when loaded, on the ordinary construction elevator capable of carrying a ton.

The man-power savings of a Prime-Mover is an important factor on these duties: moving equipment and tools, hauling concrete and aggregates, handling plaster, finishing fixtures and roofing materials. Blade attachment handles light grading jobs and snow removal.

Write to us for name of distributor and complete data.



THE PRIME-MOVER CO., Muscatine, Iowa

THE Bell PRIME-MOVER

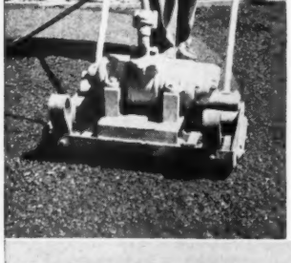
FOR FAST, EFFICIENT COMPACTION of ASPHALT (HOT OR COLD)

IN HIGHWAY PAVING and WIDENING . . . WALKS and DRIVES . . . WATER-BOUND MACADAM BASES . . . RAILWAY PLATFORMS and STREET CROSSINGS. Also GRANULAR SOIL COMPACTION of SUB-BASES, in TRENCHES, etc.

The JACKSON VIBRATORY COMPACTOR

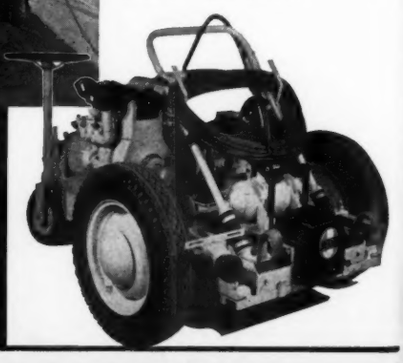
offers tremendous opportunities for saving time and money, and the job it does is unsurpassed by equipment costing many times its price.

IT DELIVERS UP TO 4500 1¾ TON BLOWS PER MINUTE . . . PROPELS ITSELF UP TO 25 FEET PER MINUTE . . . FIRMLY COMPACTS 900 to 1200 SQ. FT. PER HOUR CLOSELY APPROACHING THEORETICAL DENSITY OF ASPHALTIC MATERIAL BEING USED . . . IN GRANULAR SOILS QUICKLY ACHIEVES 95% OF MAXIMUM DENSITY.



It's rugged and reliable. Has just one moving part — the shaft of the heavy-duty motor. Operates on 110 V. 3-phase, 60 cycle AC from Jackson Power Plant mounted on trailer, which generates both single and 3-phase current and may be also used to operate other tools and lights. Capacity: 2.5 KVA.

Trailer has hydraulic jack for quickly lifting and lowering compactor and is a great time saver on many types of jobs. Easily attached or detached from auto by one man. See your Jackson distributor or write for complete description.



JACKSON VIBRATORS INC. LUDINGTON MICHIGAN U.S.A.

Distributor Doings

(Continued from preceding page)

d one of the largest distributors of nternational Harvester industrial quipment, having taken on the franise in 1926. In addition to Internaonal, the company handles Hough actor shovels, Bucyrus-Erie shovels, dams road graders, Ross lift trucks, d other related lines of heavy equipent.

When you look at the large modern ants owned by Browning-Ferris in allas and Houston today, it is hard to elieve that they grew out of a small op in Dallas which was established 1913 by W. A. Browning. A mechanal-minded young man, Mr. Browning n his shop alone for 13 years and en, in 1926, Royal A. Ferris, Jr., ined him and together they incorpoted the Browning-Ferris Machinery o. An important expansion program llowed, including the establishment a plant at Houston, and when in 1949 r. Ferris sold out, the company was e owner of two up-to-date plants at allas and Houston with roomy airnditioned offices, warehouse and disay space, and well stocked parts deartments. Today, sales and service eas in the two plants combined would ver more than three city blocks.

Mr. Browning, the founder of the m, whose initiative and leadership rried through the expansion to Houson, died on May 24, 1951, his 70th rthday. The present President is W. F. ooldridge, who joined the organizaon in 1928 as a stenographer, rose pidly in the firm, and was elected resident in 1949. Vice President G. itchell Deane was elected at the same me from his former position as Sales anager at Houston. Since then other ditions have been made to the executive staff, and some key men are: B. V. hristie, Treasurer; L. C. Fuller, Vice resident and Manager of the Dallas ant; and Doyle Mowrer, Assistant ant Manager in Houston. There are 40 les engineers, many of whom have as uch as 30 years of machinery experice.

Browning-Ferris sales territory covs, generally speaking, the eastern, rtheastern, and southeastern sections of Texas, and principal cities included, besides Dallas and Houston, are Fort Worth, Austin, Galveston, Beaumont, Port Arthur, Wichita Falls, Waco, Tyler, and Texarkana. In 1950 the firm also sold equipment to Texas contractors who were working in 22 other states.

Philadelphia Dealer for Waco

Santo Bianchini & Sons, 7926 Temple Road, Philadelphia, Pa., has been granted exclusive distribution rights in the Philadelphia area for Waco steel scaffolding equipment manufactured by Wilson-Albrecht Co., Minneapolis, Minn. Santo Bianchini has established a separate Waco Division to handle the entire Waco line of steel scaffolding, masons' and scaffold jacks, portable elevators, and material-hoisting towers.

Harris Pump Is Cleco's Latest

Harris Pump & Supply Co., Brady and Sidney Sts., Pittsburgh 3, Pa., has been appointed distributor in the Pittsburgh area for The Cleco Division of The Reed Roller Bit Co., Houston, Texas. Harris Pump will handle the complete Cleco and Dallett lines of air tools and accessories.

Alvin Hall Co. for Caterpillar

Caterpillar Tractor Co., Peoria, Ill., has appointed Alvin Hall Machinery Co. its distributor in southwest Texas and southern New Mexico. The new company occupies the facilities formerly used by Tri-State Equipment Co. in El Paso and will serve the territory covered by this firm, plus certain southern New Mexico counties in the El Paso-Odessa trade area.

The president of the company is Alvin G. Hall, formerly President of Pioneer Contracting Co. of Dyersburg and Memphis, Tenn. The General Manager is C. E. Jones, associated with Caterpillar since 1946.

Garlinghouse Is Lube Dealer

Ed J. Towey, formerly Vice President of Diamond Iron Works, is associated with Garlinghouse Bros., 2415 E. Washington Blvd., Los Angeles, Calif., in the sale and promotion of Lubriplate lubricants in southern California. Garlinghouse is the new distributor for the construction, transportation, agricultural, and marine-application lubricants manufactured by Fiske Bros. Refining Co., Newark, N. J. The line includes grades of Lubriplate for protection of bearings and every kind of moving part in all construction equipment.

New Distributor for Hydro-Line

Paul E. Wilson, 2636 S. Michigan Ave., Chicago 16, Ill., is now representative in Chicago and northern Illinois for Hydro-Line Mfg., Co., Rockford, Ill., manufacturer of air and hydraulic cylinders.

Brik-Toter Dealers in 6 States

The Brik-Toter Division of Mar-Rail Conveyor Co., Pawtucket, R. I., has appointed several additional distributors for its portable conveyor for construction-materials handling: Arrow Contractors Equipment Co., Chicago, Ill.; Don F. Nickels Equipment Co., Grand Rapids, Mich.; Schuster Equipment Co., Detroit, Mich.; and Stewart Equipment Co., Harrisburg and Philadelphia, Pa.

Rish Equipment Co. will handle the Brik-Toter in Cincinnati, Ohio; Richmond and Roanoke, Va.; Bluefield, Clarksburg, and Charleston, W. Va.

Bleiler Is Osgood-General Dealer

The R. W. Bleiler Equipment Co., Inc., 579 New Park Ave., West Hartford 10, Conn., has been appointed distributor in the state of Connecticut for the Osgood Co. and the General Excavator Co., Marion, Ohio. Bleiler will handle the complete Osgood-General line of shovels, draglines, cranes, clamshells, hoes, pile drivers, etc.

Tractor Shoes Serve Longer

WHEN YOU...

REPAIR WORN TRACTOR GROUSERS with MANGANAL

U.S. Patents 1,876,738—197,167—2,021,945

11% - 13½% Manganese-Nickel Steel

SPECIAL SHAPE APPLICATOR BARS

1. USE MANGANAL ELECTRODES to rebuild worn Tractor Sprockets, Rollers and Idlers.
2. Use MANGANAL ROUND or SPECIAL SHAPE APPLICATOR BARS to repair edge of Tractor Blade.
3. Use MANGANAL FLAT APPLICATOR BARS to repair worn Bulldozer Corner Bits.
4. MANGANAL usually outlasts new parts.

Write TODAY for FREE Literature . . . outlines newest methods of economical repairs.

•

NAME OF NEAREST DISTRIBUTOR UPON REQUEST

STULZ-SICKLES CO. SOLE PRODUCERS 91 N. J. Railroad Ave. Newark 5, New Jersey

GALION VARIABLE WEIGHT PORTABLE ROLLERS

ATTACH AND TRANSPORT AS EASILY AS A TRAILER!

PROFITABLE TO USE

With the GALION Portable Roller you get outstanding features such as . . . hydraulic steering . . . rugged spur gear drive . . . variable weight . . . constant-mesh transmission . . . large diameter compaction roll . . . 42" rolling width . . . 25 h.p., 4 cylinder gasoline engine. No other roller of equal compaction efficiency is so easy to transport from job to job. Ideal for maintenance work and miscellaneous rolling jobs.

Write for literature.

GALION

ESTABLISHED 1907

MOTOR GRADERS • ROLLERS

THE GALION IRON WORKS & MFG. CO.

General and Export Offices — Galion, Ohio, U. S. A.

Cable address: GALIONIRON, Galion, Ohio

Airways Engineering V. P.

Colonel Harry E. Fisher, an active commissioned Officer of the U. S. Army Corps of Engineers for over 27 years, has been appointed Vice President of the Airways Engineering Corp., Washington, D. C. He will help supervise the company's architect-engineer work in airport planning and facilities design and management.

The Airways Engineering Corp. handles all types of domestic and foreign site planning and facilities design, but it specializes in airport planning, development, and design, in aviation facilities design, and in management problems.

Do those plowed field jobs this winter when the ground is frozen!

Bore through FROZEN Ground WITH A PENGO Auger

- *Avoid crop damage*
- *No getting stuck in the mud*
- *Improve public relations*

DO a faster, *better* job with a scientifically-designed PENGO Auger—the twin-helix auger that bores clean, true holes in any kind of soil, most sandstones, hardpan, decomposed rock, frozen ground—and even in permafrost. Saves power, cuts maintenance to a minimum! 15 sizes; to fit any earth boring machine.

★ **ORDER NOW** *or write today for data and prices*

PETERSEN ENGINEERING CO.
MANUFACTURERS
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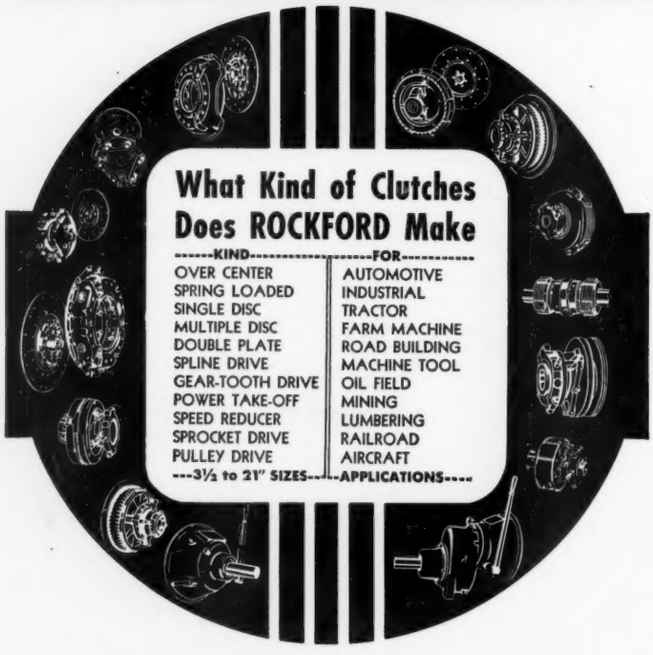


ROCKFORD CLUTCH DIVISION
BORG-WARNER
314 Catherine Street, Rockford, Illinois

ROCKFORD CLUTCHES

A Job Abroad? Think First

Word has it that many skilled construction men are falling victim to a "gold-rush" mentality and are giving up well paid jobs at home in order to take work at "fancy" wages on American construction projects abroad. James H. Dillon, President and Executive Secretary of the Construction Men's Association, New York, has issued a warning to men lured by these fancy wages.

The rumored "exorbitant pay and overtime benefits" simply don't exist, according to Mr. Dillon. As a construction superintendent and personnel manager with 25 years' experience in many countries, Mr. Dillon strongly advises all plumbers, carpenters, electricians, and engineers to stay where they are if they have good jobs.

The sober facts of this foreign-job business, as given by Mr. Dillon, are: It is true that men on foreign jobs run up a higher gross pay than those in the United States, but, after deductions are made for social security, board and lodging, and return passage, net pay is about the same. Hourly wages are lower than those in a cross section of 85 cities throughout the United States. Foreign jobs are pushed to completion as rapidly as possible, which means that the men work ten hours a day, seven days a week. Time and a half is sometimes paid after 40 hours, but there is never double time on Saturdays and Sundays as there is at home. Some other factors on the debit side are the conditions to be found on construction projects abroad. The man who has never left home must be prepared to face a contract ranging from 18 months to three years; temperatures ranging from 60 degrees below zero to 160 above; mosquitoes. flies, vermin, snakes, wild animals; lack of privacy in barracks; doubtful food often prepared by native cooks with primitive ideas of sanitation; and, finally, homesickness.

Mr. Dillon realizes that the spirit of adventure will not be downed by such considerations, but he feels it his duty not to let anyone go to one of these jobs without a fair idea of what to expect. The Association he heads is a mutual welfare organization with a membership of 10.000 skilled specialists and technicians who work on construction projects outside the United States. It was organized in 1944 to handle problems and complaints of individuals on foreign jobs, because such jobs are not covered by labor unions.

The Salsbury G-200 air hammer here uses a curved shank chisel with a 1½-inch face to remove welding spatter on a truck body.

Pistol-Grip Air Hammer For Maintenance Wor

An air hammer for shop an maintenance work has been develope by the Pneumatic Tool Division Salsbury Corp., 1161 E. Florence Av Los Angeles 1, Calif. The Model G-2 hammer weighs slightly over 2 poun and features a pistol grip with simp trigger action.

Working at 120 psi, the hamm strikes up to 6,000 blows per minu but can be metered to lower speeds desired. A newly patented 3-poi ball-bearing chuck locks the tool working position and eliminates t hazard of tool ejection, the compa says. The driving piston is the on moving part.

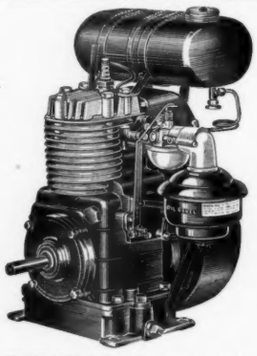
The new air tool is offered alone with specialized tool kits for vario types of service. Sixty tools are reg larly available for use with it, a blanks are offered for making indivi ual tools for special tasks. The co pany recommends the hammer for ge eral maintenance, cleaning weldi spatter, motor-block repair, body co struction, marine scaling, caulki rust chipping, and similar work.

Further information may be secur from the company. Or use the Requ Card at page 16. Circle No. 149.

Two Miniature Catalogs

Two 28-page miniature catalogs precision lathes, drill presses, shape attachments, and accessories are off ed by South Bend Lathe Works, So Bend 22, Ind. The little accordi folded catalogs are 2½ by 1⅝ inch They include an illustration and d scription of each product.

They may be obtained from the co pany by requesting Catalogs 5104 a 5119, or by using the Request Card page 16. Circle No. 130.



MODEL K-12-2, *3 H. P., 4-cycle, single cylinder, air-cooled. Length 14", width 14", height 19". Weight 43 lbs.*

RELIABLE POWER FOR:
Concrete Mixers • Road Oilers • Compressors
Floor Sweepers • Generators • Hoists
Lift Trucks • Centrifugal Pumps
Portable Saws
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KOHLER ENGINES

Four-Cycle, Air-Cooled

Kohler Engines are engineered and built to give the economical service that has won world-wide acceptance for Kohler Electric Plants in construction and other industries. Made in several sizes, they are suited to a wide range of uses. Kohler engineers will gladly assist in working out applications for your particular requirements. Write for information.

Kohler Co., Kohler, Wisconsin. Established 1873.

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or Described
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in This
Issue

Use the Request Cards Between Pages 16 & 17 To Obtain Further Information or Printed Matter on Any Product Advertised or Described Editorially in This Issue

Submersible Pumps Provide Dry Trench

Here's a story from Kenco, Inc., manufacturer of submersible pumps, telling how the general contractor on the Stamford, Conn., Housing Project solved a serious problem. A pump failure on that job threatened to halt laying of a drainage pipeline. Since the line ran through some very swampy ground, another pump had to be secured in a hurry. A 6-inch pump powered by a 3-phase motor was available, but it required a 200-volt power source—the only one was over 2,000 feet from the trench. Rather than go to the expense of running a power line to the pump site, the contractor purchased two Kenco automatic, submersible pumps which could use the 110-volt power available close to the pumping site.

His men dug a small sump at the lowest point of the ditch and partially filled it with slag. Then they made a basket for the pump with 2 x 12-inch planks as a bottom and a heavy circular screen on the outside to keep out rocks and foreign matter. The pumps could then be submerged right in the ditch, since they are hermetically sealed and run in oil. The ½-hp Kencos were able to operate on a 24-hour basis for 5 days until the job was complete.

One of the objections to pumps with small motors has been that they burn out frequently, but Kenco explains that the oil-filled housing construction on its units effectively dissipates heat. On the Stamford job, for example, bulldozers and draglines accidently buried the pumps, and it was not until 36 hours later that they were discovered and dug out. Even though the impellers were jammed and the motors were running continuously in a stalled position, drawing six times the normal amperage, the pumps were restored to good running order as soon as the impellers were freed of silt, the company says.

Further information on these automatic submersible pumps may be obtained from Kenco, Inc., 1125 N. Ridge Road, Lorain, Ohio. Or use the Request Card at page 16. Circle No. 148.

Pipe laying halted by water in the trench . . . a couple of Kenco submersible pumps to the rescue . . . and pipe laying resumes in a dry trench. The 1/3-hp pumps operated off a 110-volt power source near the site of a housing project in Stamford, Conn.

Reinforced Flat-Base Pipe

A 4-page catalog on reinforced-concrete flat-base pipe is offered by Universal Concrete Pipe Co., 297 S. High St., Columbus, Ohio. It includes illustrations, specifications, and descriptions of the pipe, which is available in sizes from 46 x 46 inches to 97 x 97 inches.

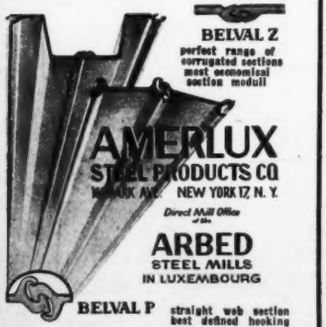
The pipe can be used upright or inverted for culverts, conduits, pedestrian underpasses, utility galleries, and manholes. Pipe for each application is produced ready for use on the job, without modification, the catalog says. It further explains that flat-base sections can be laid in new fills or jacked through old construction. A lifting hole facilitates handling and positioning. Joints are tongued and grooved and can be made watertight with rubber gaskets.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 188.

Cummins Assistant Managers

Two promotions announced by Cummins Engine Co., Inc., Columbus Ind., are as follows. R. A. D'Amour is named Assistant Regional Manager, Washington, D. C., Region; and G. W. Plondke is Assistant Regional Manager, Central Region. Both men were formerly sales engineers employed at the factory, and both joined the Cummins organization in 1948.

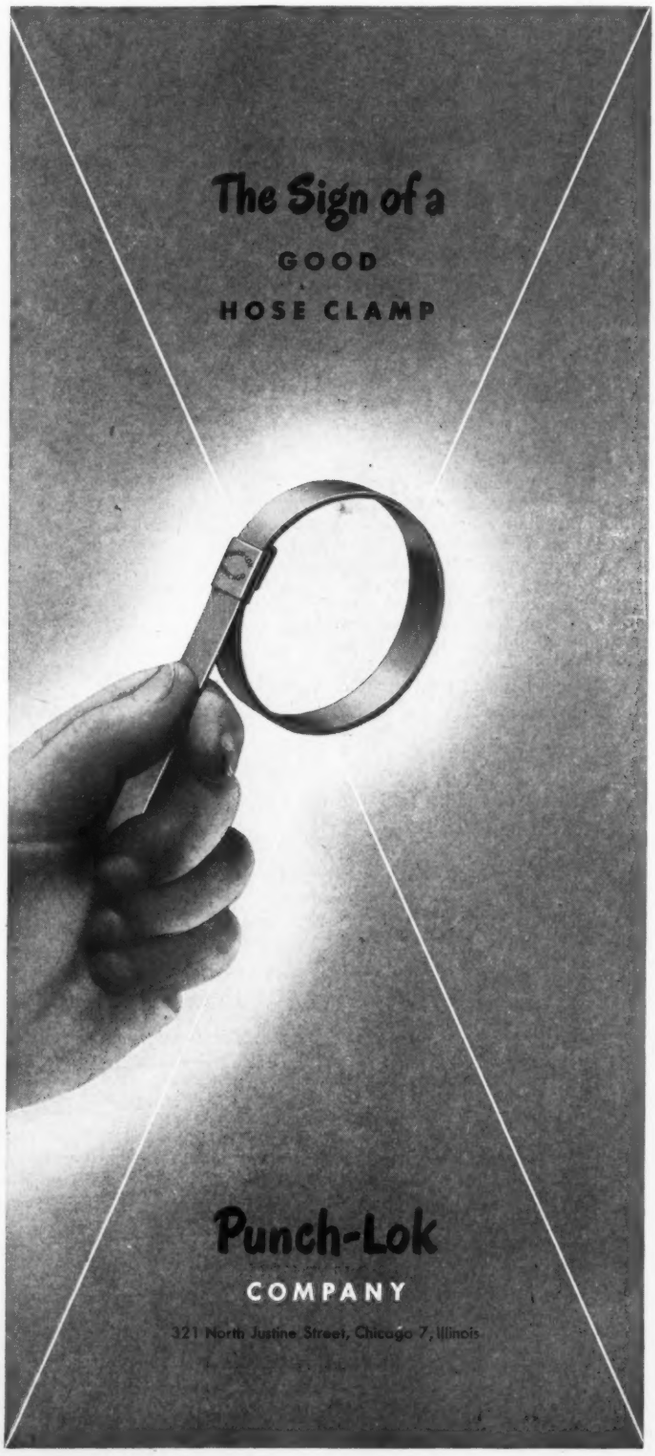
STEEL SHEET PILING



BELVAL Z
perfect range of corrugated sections most economical section moduli

AMERLUX
STEEL PRODUCTS CO
NEW YORK 17, N. Y.
Direct Mill Office of the
ARBED
STEEL MILLS
IN LUXEMBOURG

BELVAL P straight web section best defined hooking



TAGLINE CONTROL

HERE'S WHY:

You get *more work* out of a bucket that holds steady and is back in position *quicker* for another bite. Rud-O-Matic Taglines have ample coil spring power to provide constant tension for steadying the largest clamshell buckets at any angle of the boom.

You get *lower costs* through faster operation coupled with Rud-O-Matic's trouble-free service. No pins, weights or tracks to get out of whack, only the simplest of working parts. Compact — and easy to install on any crane.

Rud-O-Matic Taglines are made in 8 models for all bucket sizes, and are supplied with cable and installation equipment. *Immediate delivery from your nearby equipment dealer — or send coupon below for details.*

I'd like more information on Rud-O-Matic Taglines. Send literature and complete details.

Name_____

Company_____

Address_____

City_____ Zone____ State____

McCAFFREY-RUDDOCK
Tagline CORPORATION
2131 East 25th Street • Los Angeles 58, California

Engineer Must Lead In World of Today

(*Continued from page 3*)

office, on party politics, and on almost everything except the real cause—lack of intelligent, honest leadership, that has created a confusion in the electorate of every democratic country and loss of confidence in established political institutions. Every honest, thinking man knows that every administration in office adheres reasonably closely to the attitude of the majority, and we all know that government is simply us, every single citizen.

No groups in our economy, either in their daily work or in their essential attitude to the accomplishment of their jobs so completely refute these politico-economic doctrines as does the Engineer. Show me the professional man who works by the clock and the dollar sign; the man who has lost his high sense of values in moral principles; he who no longer believes in the dignity of hard work, in the rights of his fellow man, but accepts the principles of state control of ideas, denial of initiative, and confiscation of risk investment—show me that man and I will show you a charlatan and a menace to his community.

Add to the basic qualifications and experience of the Engineer the public confidence in which he is deservedly held, and you have my thesis: that immediate assumption of leadership in public thinking is not only the urgent responsibility of the Engineer, but is his best hope of conserving the fruits of the labor of his profession and of modern civilization.

And there is another and equally important opportunity for leadership by the Engineer. Some 22 years ago, the then second-ranking Communist leader in Russia told me that their plans and program for world expansion were based primarily on the exploitation of the weaknesses and sore spots within each other nation, particularly the democracies, so as to set class against class and stir up labor-management disputes so that they would reap the harvest of resulting chaos. Ever since it was pointed out to me, in those private conversations in Moscow, that ours was one of the societies most vulnerable to communistic encroachment, because our country harbored the greatest extremes in religious, racial, and sectional intolerance—ever since that time I have been trying to point out to engineers the power that they possess to oppose intolerance in all its forms.

Many engineers have enjoyed the sort of rich experience that I have—that of working closely and intimately with the peoples of many lands. Not those of a single class such as management, labor, industry, press, or diplomacy, but the peoples of all classes. For the Engineer must know and hold the confidence of all with whom he works, from the lowest peon to the governor, if his work is to succeed.

Of the many people of differing nationalities with whom I have worked, I have never known any that I did not like and admire. Some of my most loyal friends are men of widely different faith, race, and culture than my own.

Out of these experiences and friendships in foreign lands has grown my conviction that the unique experience of the Engineer—unique because of the full confidence and trust in which he must be held—place him in the most ideal position to expose to the light of public view the most cancerous growth in our body politic: our intolerances.

The rich opportunity that confronts the Engineer for leadership in guiding men's thinking back to the simple precepts of faith in their God, the dignity of work, and the essential brotherhood of man throughout the four corners of the earth are poignantly illustrated in Nevil Shute's recent book "Around the Bend".

If I were a Paul Hoffman to administer the magnificent Ford Foundation, I would distribute a copy of this book to every engineer in every land, because this book offers the sort of basic philosophy which men crave. It demonstrates the importance of the industrious life; the reliance that men must place in the Engineer for their every-day safety, and therefore the internationality of engineering science; the unity of the aspirations and goals of men; and the fact that man's innate desire for brotherhood is thwarted on by evil leadership.

If our great engineering profession in all its branches can take from this book its clear injunction that theirs is the task of leadership out of our present international confusion of thinking away from our soul-destroying philosophy of maximum return for minimum effort—then and only then will we have justified our pride in the past 100 years of engineered progress and have proved our right to the rich legacies in tradition and great work that we inherit.

For the ASCE membership this means a dedicated, civic leadership program in every local section. Such programs should include continuous activity and participation in all matters of public welfare, and particularly in subjects relating to the social influences, economic impact, and cultural implementation of the direct products of engineering effort. It requires interest in and influence on school boards

(*Concluded on next page*)

RUGGED STRENGTH
SIMPLE DESIGN
Easy Operation
Positive Action
ECONOMICAL
—to operate
—to maintain

WARRINGTON-VULCAN
SINGLE-ACTING
STEAM
PILE HAMMERS

Drive wood, concrete, or steel piles this low-cost dependable way. For almost 55 years the Warrington-Vulcan has been demonstrating its great ability on many important jobs in the United States and other countries. It operates at a medium steam pressure and delivers a moderate frequency of low velocity blows from a relatively heavy ram. Free from mechanical troubles, you are assured of regular and continuous action. Write for complete details.

VULCAN IRON WORKS
Since 1857
329 North Bell Avenue
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Everything in
SHEAVES
for wire rope

PROTECT YOUR WIRE ROPE with genuine American Hoist replacement sheaves. Same top quality used on all American Hoist cranes and other big name equipment. Complete stocks, all types and sizes. Prompt shipment from either St. Paul or So. Kearny plant.

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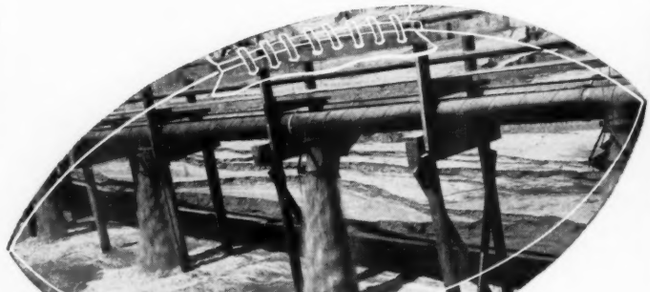
NAYLOR PIPE
....Light in Weight,
but ALL-AMERICAN in the Line



No wonder Naylor Pipe is the choice among contractors for dependable performance, day in and day out.

Backing up this all-star line is Naylor's exclusive Lock-seam-Spiralweld structure which provides the extra strength and safety so important in construction.

When you combine this distinctive lightweight pipe with Naylor's one-piece, positive-type Wedge-Lock couplings, you have teamwork that produces the results you want.

Write for bulletin No. 507 describing Naylor Pipe, and bulletins No. 513 and No. 514 covering the Naylor Wedge-Lock couplings.

NAYLOR Lines cover the field—High and low pressure air lines; high and low pressure water lines; ventilating pipe; cement pumping pipe; dredging pipe; hydraulic sluicing pipe; de-watering and drainage pipe; sand and gravel conveying lines; well-point systems; composite piling; and exhaust and intake piping.

NAYLOR PIPE
Naylor Pipe Company, 1270 E. 92nd St., Chicago 19, Ill.
New York Office, 350 Madison Avenue, New York 17, N.Y.

public-works commissions; local, state, and national legislation; and above all, the exercise of political and economic guidance in public affairs.

For you as an individual engineer, it means an active interest in your local section and its possibilities for leadership in your community. It means your taking the lead when necessary in the development of those possibilities. It means your willingness to accept and to work on committee assignments, local and national. In short, it means that each one of us must use for public as well as for personal welfare the engineering common sense that the practice of our profession instills in all of us.

The 400,000 engineers of our nation possess today a magnificent opportunity for this profession's greatest contribution to the cause of civilization. I hope the American Society of Civil Engineers will accept its full share in making such a contribution during the coming year.

Thor Export Sales Manager

William V. Shakespeare has been appointed Sales Manager of the Thor Export Sales Division of Independent Pneumatic Tool Co., Aurora, Ill.

For the past 15 years Mr. Shakespeare, who joined the Thor organization in 1936, has been a field engineer in the Export Division and has traveled widely for the firm. In his new position, his headquarters will be with the Division at 330 W. 42nd St., New York 18, N. Y. He will share with E. R. Wyler, Vice President and Director of the Division, supervision of Thor export subsidiaries in various foreign countries. Both men will undertake separate world tours early in 1952.

U. S. Water Shortage Creates Big Demand For New Construction

Increased demands for pure water are seriously taxing the nation's existing means of supply. Steps must be taken to increase and expand water-supply facilities if the United States is to cope with new and growing water requirements, according to Dr. Leonard A. Scheele, U. S. Surgeon General, and Charles H. Capen, Vice President of the American Water Works Association. Speaking at the opening of General Electric Co.'s water-supply program in September, both men emphasized the need for nation-wide cooperation in meeting the problem.

Dr. Scheele, head of the U. S. Public Health Service, declared that the increase in normal U. S. water requirements has been prodigious. The demand for water is four times as great today as it was 50 years ago. Construction of needed water-supply facilities would cost approximately $2,500,000,000, he said. To bring our water system to a satisfactory level in communities not adequately served we need 3,200 new water-treatment plants, 9,000 wells and well pumps, 8,200 water-storage tanks, and more than 45,000 miles of pipe, according to Dr. Scheele.

Mr. Capen, who is also Chief Engineer of the North Jersey District Water Supply Commission, declared that lack of water can stifle community growth and national strength, and could force a redistribution of the nation's population. He urged that immediate action be taken to meet not only present needs but anticipated requirements of 50 years from now. Mr. Capen said the nation's water-works engineers are "fully aware of the mounting need for quick, effective action to produce additional water supplies". But they are hampered, he said, by public apathy and lack of funds. He called for public education, higher water rents, and larger allocations of money for water works as positive answers to the growing problem.

The visual program prepared by the General Electric Co. includes a 25-minute sound-color film, "Pipeline to the Clouds". It portrays the growing seriousness of water shortages and is intended to spark public interest in water-works projects. The packaged program, latest in the company's "More Power to America" series, will be shown in hundreds of communities throughout the country.

Objectives of the program were explained by William V. O'Brien, G-E Vice President and Manager of Apparatus Marketing, and Hans R. Wallrath, Manager of the Construction Industry Section.

End-Discharge 6-S Mixer

A circular describing the Rex end-discharge 6-S mixer is available from Chain Belt Co., 1666 W. Bruce St., Milwaukee 4, Wis. In addition to complete specifications on the unit, it includes a photograph and describes principal features such as the low center of gravity, the flexible chain drum drive, the grouped easy-arc controls, and the mixer's rugged construction. The Rex 6-S is available with a choice of power: 1 or 4-cylinder air-cooled gasoline or electric drive. It also features a 12-gallon syphon-type water system.

This literature may be obtained from the company by requesting Specification Sheet 51-6S, or by using the Request Card at page 16. Circle No. 105.

Hydraulic Scrapers

A circular on Series H hydraulic scrapers has been issued by American Tractor Equipment Corp., 9131 San Leandro Blvd., Oakland 3, Calif. It includes a photo of the Model H-85, and lists operating features and detailed specifications for the six models in the Ateco series, ranging in size from 4.5 to 11.5 heaped yards.

This literature may be obtained from the company by requesting Form No. 5951, or by using the Request Card at page 16. Circle No. 196.

Bituminous DISTRIBUTORS with Original Rosco Features

For over 20 years, we've pioneered features that are now universally accepted . . . Automatic Pressure Metered application . . . patented V-Jet nozzles . . . folding safety spraybar. These are features that will save you money on the job. Write for literature.

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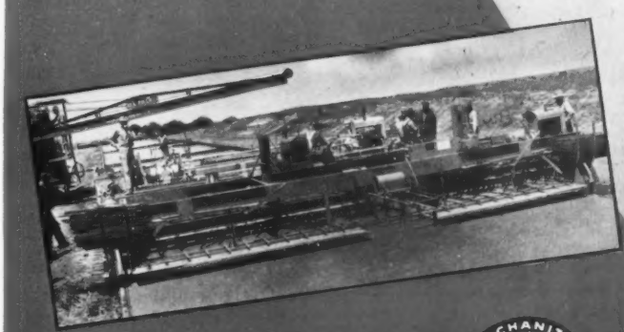
ROSCO MANUFACTURING COMPANY
3124 Snelling Ave. • Minneapolis 6, Minn.

"No question—Flex-Plane saved us $5000"....

"The FLEX-PLANE Mechanical Bar Installer did the work quickly and kept dowel bars evenly spaced, much to the satifaction of the engineers. There's no question that our savings were in excess of $5000 on the first job." This from C. W. Alley, Assistant Secretary of the Worth Construction Company of Fort Worth, Texas.

Wherever it has been used the FLEX-PLANE Mechanical Bar Installer has recorded savings that frequently pay for the equipment on the first job by eliminating expensive dowel holding devices, and the labor of installation; by installing bars more accurately and in better alignment; and by simultaneously installing contraction joints.

Before you start your next job look into the many advantages of the FLEX-PLANE Mechanical Bar Installer. Write *The Flexible Road Joint Machine Co., Warren, Ohio.*

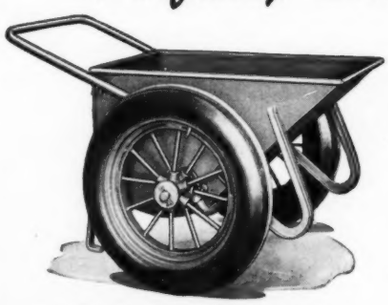


WHEREVER THERE'S CONCRETE

MECHANIZED Flex-Plane CONSTRUCTION EQUIPMENT

CONCRETE CARTS
EASY to WHEEL—EASY to DUMP

Perfectly Balanced!



No. 626-PR Sterling Cart with dumping rockers and 4.00 x 18 pneumatic tires.

Just the cart you need for hauling concrete or other materials. Takes a full batch from small mixers without danger of spilling. 6 cubic foot capacity, water full. Sterling quality construction. Tray made of 14 gauge steel with continuous ½" diameter butt-welded rod to reinforce top edge. 1¼" T-iron rockers facilitate dumping. Roller bearings standard equipment. Choice of 30" dia. steel wheels or pneumatics. Write for Sterling Cart Catalog No. 63.

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

Look for this Mark of STERLING Quality

Sterling WHEELBARROWS

A 5751-½

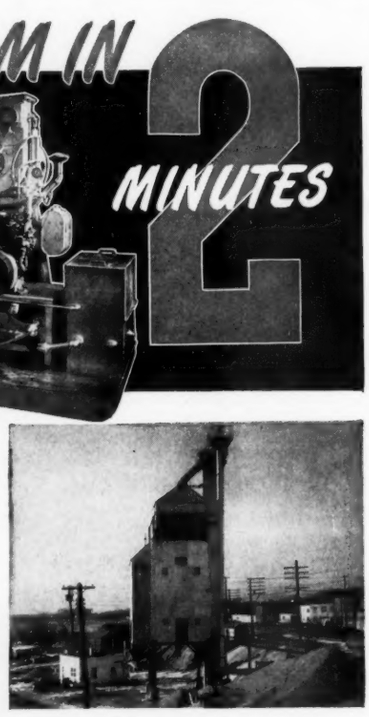
Two New Wattmeters For Radio-Testing Sets

Two small resistive-load wattmeters for use with Motorola P-8501 and P-8501-A test sets or any 0-50 microammeter have been designed by Motorola, Inc., Communications & Electronics Division, 4545 W. Augusta Blvd., Chicago 51, Ill.

The Model P-7208 measures radio-frequency power output from zero to 60 watts and is used for testing base stations and mobile-unit transmitters. The Model P-7208-A measures transmitter power output from zero to 2 watts and is designed to test portable units such as the Handie-Talkie radiophone. The output of the transmitter being tested is fed into the wattmeter load, and the suitable indicating device is connected to the jack provided. The calibration chart supplied is used to correlate the power dissipated in the load unit and the meter readings. A hermetically sealed crystal diode and a 1 per cent metalized multiplier resistor are incorporated in the unit.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 153.

READY-MIX CONCRETE PLANTS WITH A LITTLEFORD "Kwik-Steam" VAPOR GENERATOR



Here's the fastest most modern steam producing unit ever designed. You get steam in 2 minutes time from a cold start and save as much as 50% in fuel and labor. No experienced operator is needed, no hard fuels, no starting hours ahead to get steam. Just start the "Kwik-Steam" Generator and the automatic controls take over. This amazing unit cycles off and on to produce steam only when needed. Burns low cost fuel oil. It's small, compact and made in sizes from 20 to 165 B.H.P. Can be used also for cleaning equipment, steaming aggregate cars, heating water. For Fast, Safe, Economical service, all Ready-Mix Concrete Plants should have a "Kwik-Steam" Generator. Write for Bulletin 22 for further details.

LB LITTLEFORD
BLACK TOP ROAD MAINTENANCE EQUIPMENT SINCE 1900
LITTLEFORD BROS., INC., 485 E. PEARL ST., CINCINNATI 2, OHIO

Bibliography on Landslides

The Highway Research Board's Bibliography No. 10 is a selected annotated list of literature dealing with landslides, compiled from sources all over the world. The references cover the period 1920 to 1950 and have been chosen as the most helpful to engineers, geologists, and others concerned with landslide problems. A few pre-1920 articles of particular value are included. The bibliography is subdivided for quick reference, the subdivisions covering: landslide description, including general classification and individual types of slides; landslide investigation; and the control and prevention of landslides. The bulletin includes a table of contents under the above heads and an index of authors and sources.

"Landslides" (HRB Bibliography No. 10) is compiled by Jessie M. Tompkin and Severine H. Britt of the U. S. Department of the Interior Geological Survey. It may be obtained from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C., at a cost of 90 cents.

G-E Appoints McCune

Francis K. McCune has been appointed Assistant Manager of the Engineering Services Division of General Electric, Schenectady, N. Y. Mr. McCune joined the company in 1928 as a student engineer on the test course, and from then until 1951 he held positions in various departments of the company. At the time of his new appointment he was Manager of Engineering of the G-E Large Apparatus Division.

Yankee kerosene flares come in threes—in a bracket or steel box. The red flags are 12 x 12 inches.

Two Kerosene Flares

Two flame-type kerosene flares for emergency use with trucks or cars are announced by Yankee Metal Products Corp., Norwalk, Conn. They are available in bracket and box types.

The bracket type consists of three flares set vertically in a bracket, which can be locked for security. The flares, finished in red enamel, can be used inside or outside the bracket. The updraft burners are said to give a steady, bright light in wind or rain.

The box type has three burners set in a heavy steel container. They can be mounted vertically or horizontally. Red flags, 12 x 12 inches, and with a wire staff are also available. They can be folded and packed in the box.

Both types of burners are finished in red enamel. They hold 48 ounces of kerosene, and have a burning time of 16 hours on one filling, the company says. They meet Federal, state, and ICC requirements and are also approved by the Underwriters' Laboratories.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 132.

Earth-Moving Attachments

An 8-page bulletin on hydraulic and cable-controlled earth-moving attachments for Allis-Chalmers crawler tractors has been issued by The Baker Mfg. Co., 2573 S. 10th St. at Stanford, Springfield, Ill.

The attachments include the engine-mounted hydraulic-control bulldozers, Gradebuilders, and root rippers for the HD-5, HD-9, HD-15, and HD-20, and the three cable-control units for the HD-9, HD-15, and HD-20. The bulletin lists specifications of moldboard height and width, height of lift, depth of cut, degree of tilt, weight of blade and mounting, and over-all length of tractor and blade.

This literature may be obtained from the company, or by using the Request Card at Page 16. Circle No. 213.

THURMAN PORTABLE TRUCK SCALE

- Platform Lengths 18, 22, 24 & 30 ft.
- Capacities 20, 25 & 30 Ton

The Scale that can be moved from job to job

Special sizes made to meet special requirements

Wide Steel Bases—support scale—require no concrete footings. Easy-to-read chrome plated weighbeam with vital parts electroplated against corrosion.

Accurate and Portable—This scale can be transported from job to job by removing 6 nuts which hold side arms in place. The rest of the scale can be lifted as a unit. Once located, it can be readied for use in minutes.

THE COMPLETE THURMAN LINE INCLUDES:

- Pit Scales up to 50 ton capacity
- Pitless Scales
- Batching Scales
- Liquid Weighing Scales
- Wheelbarrow Scales
- Warehouse Scales

This and other weighing equipment in sizes to fit your requirements.

THE THURMAN MACHINE CO.—Scale Division

154 North Fifth Street — Established 1918 — Columbus 15, Ohio

The BACHTOLD MOWER with attachments does more jobs

It SAWS. Big 20" saw blade can be used in either horizontal or vertical position. Powerful, fast.

It MOWS right up to bushes, trees, buildings, etc., cutting a 20" swath evenly. Adjustable runner. It CULTIVATES almost any kind of soil.

- Easy starting
- Finger-tip control
- Portable
- Compact
- Fully guaranteed
- Push-type and self-propelled-type models

BACHTOLD BROTHERS, INC. Forrest, Illinois

Road-Building Toys Have Many Sales Uses

Several equipment manufacturers find that the use of toys that duplicate the major features of their equipment is an excellent sales-promotion device. The toys are the idea of two brothers, Charles and Fred Doepke, and in five years they have established a national reputation for them. Sturdily built, they are based on blueprints which equipment companies loan to the brothers. Manufacturers have no interest, financial or otherwise, in the Doepke Mfg. Co., but have found many different uses for the toys.

How do the companies use the toys? Unit Crane & Shovel says the cost of the toy makes it prohibitive as a general giveaway item, but not as a special sales stimulant or good-will builder. Many have been added to model collections in industrial offices or display rooms. Euclid Road Machinery's bottom-dump truck is used in local window displays to familiarize the general public with its design and construction. J. D. Adams reports that its distributors order the Doepke-Adams road grader to use as door prizes at open houses and conventions and as gifts to customers. The company has placed the toy on exhibition at the National Road Show, and has presented some to engineering schools and the Army Engineers. Barber-Greene has distributed to salesmen over 1,400 models of its bucket loader during the last four years. Offered as prizes in a drawing of convention registration cards, they aid the company in building mailing lists.

A newcomer to the group this year is the Heil Co. with its model Heiliner. Production of this toy has just begun, but the company is going to follow the pattern of others in supplying salesmen with it and using it in trade shows, or as a prospect or customer gift.

The Doepke brothers also custom-build models for other manufacturers to use in their sales work. These models are relatively expensive, but the companies find them useful to their salesmen when the big, heavy equipment cannot be easily moved to a prospect's office. Special features are miniaturized in the Doepke engineering department and the main idea is to make sure the models look and work like the original counterparts. That holds true for their mass-production toys, too. They are made of 18-gage steel, for sturdiness and long life.

One of the prime values to companies is the fact that each toy, which carries the name of the company and its trade mark, popularizes equipment that has strictly industrial customers. The manufacturers feel that children who learn the name at an early age will someday be buying the original equipment.

Further information may be secured from the Doepke Mfg. Co., Rossmoyne, Ohio. Or use the Request Card at page 16. Circle No. 199.

These 1/16-scale Doepke model toys are used in sales promotion by the original equipment manufacturers. From left to right is a Heiliner scraper, Adams road grader, and Euclid bottom-dump. In the rear is a Unit mobile crane.

Timken Appoints Humphrey

George T. Humphrey, Jr., has been appointed Assistant General Manager of the Service Sales Division of The Timken Roller Bearing Co., Canton, Ohio. Mr. Humphrey was formerly Assistant Branch Manager of the company's Service Sales Division in Dallas, Texas.

REDUCE CONCRETE LABOR COSTS UP TO 60% with the WORLD'S FOREMOST "SHAKE-DOWN ARTIST"

The one-man Vibro-Plus Roll-gear Internal Vibrator will help you roll back rising labor costs and do a better job.

Available in electric, gas-engine or pneumatic-driven models delivering from 11,000 to 15,000 V.P.M. Exclusive patented features assure years of trouble-free operation.

Write for complete details and name of nearest distributor.

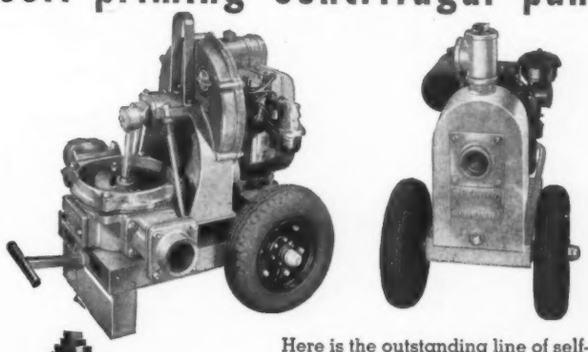
VIBRO-PLUS PRODUCTS, INC.

54-11 Queens Blvd., Woodside, L. I.

DISTRIBUTOR TERRITORIES NOW OPEN FOR PROVEN NEW LINE!

McGOWAN

self-priming centrifugal pumps



Here is the outstanding line of self-priming Centrifugal pumps in the field . . . fast sellers for an aggressive Distributor to handle. These pumps are now in operation all over the world. They are of all welded steel construction, with automatic priming, non-clogging impeller, hardened wear plates, large access plates, tested trouble free shaft seals. Sizes up to 125 M. In 3", 4", 6", 8", 10" high pressure, 3", 4" diaphragm. Built by a Company with an international reputation for quality and service since 1852.

write today

McGOWAN PUMP CO., Div. of Leyman Mfg. Corp.
Dept. J, Central Ave., Cincinnati, Ohio

Gentlemen: Please send me information on Distributor territories now open.

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COMPANY.....

ADDRESS..... STATE.....

CITY.....

SINCE 1852 McGOWAN PUMPS

See us at the AED Show, Chicago, January

McGOWAN PUMP CO. CINCINNATI, OHIO

division of LEYMAN MANUFACTURING CORPORATION

JACKMANCO

OUR SEVENTY-FIFTH YEAR

75 Years Young

As we enter our 75th year of manufacture, we are grateful to the many customers and devoted distributors, who have learned that the name JACKMANCO stands for quality of manufacture and superior performance on the job.

WHEELBARROWS
DRAG SCRAPERS
MORTAR PANS
MORTAR MIXING BOXES

CONCRETE CARTS
LAWN ROLLERS
SALAMANDERS

JACKSON MANUFACTURING CO.
HARRISBURG • PENNSYLVANIA

Avoid Legal Pitfalls

Edited by A. L. H. STREET, Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

School Cannot Protest Unspecified Improvement

THE PROBLEMS: *(1) Neither the initial resolution nor the ordinance providing for an improvement specified the nature of the improvement or its probable cost, there being no charter or statutory requirement for such specification. Were paving proceedings included in this improvement enjoinable by municipal taxpayers? (2) Was a school district board a "resident property owner" under a statute permitting owners of more than half of such property (subject to assessment) to block the improvement by protest? (3) In computing the area for protest purposes, was land owned and used by the city properly included?*

THE ANSWERS: (1) and (2) No. (3) Yes. (Horejsi v. City of Holyrood, 231 Pac. 2d 215, decided by the Kansas Supreme Court.)

1. The court cited one of its previous decisions to the effect that a preliminary resolution and an ordinance providing for recurbing and reguttering where necessary were not fatally defective because they failed to specify where such work was necessary. (Bentley v. Gunn, 125 Kans. 784, 266 Pac. 28, 30.)

2. In a previous case the court had decided that the county was not a "resident property owner" for protest purposes. (Board of Commissioners v. City of Osborne, 104 Kans. 671, 180 Pac. 233, 234.) In another case a petition for paving was held to be insufficient because a board of education was not qualified to sign, not being a resident owner. (Dunsworth v. City of Hutchinson, 109 Kans. 538, 199 Pac. 89.)

3. Palmer v. Munor, 123 Kans. 387, 255 Pac. 67 was cited as showing that it has long been established in Kansas that public grounds owned by counties, school districts, and cities, although used for public purposes, are assessable for special improvements.

Negligent Bidder Is Bound

THE PROBLEM: *An experienced painting firm bid $500 on a steel-bridge painting job. The other competing bid was $3,277. The lower bid was accepted and a representative of the firm signed a contract, which was later repudiated, mainly because its performance would have involved a loss to the firm. Could the bridge contractors be denied right to collect damages on a theory that there was such disparity between the accepted bid and the other proposal that they should have notified the painting firm of the possibility of a mistake?*

THE ANSWER: No. (Ashworth v. Charlesworth, 231 Pac. 2d 724, decided by the Utah Supreme Court.)

The decision was based upon the fact that the painting firm was negligent in estimating costs. Distinguishing the case from instances where innocent mistakes have been made in computing bids, by overlooking certain items of cost, the court noted the following facts. Assuming that the painting firm actually made a mistake, it resulted from carelessness in not seeing what they should have seen and in not obtaining readily available information. The bridge contractors believed they were dealing with contractors competent to estimate painting costs. They had not previously contracted for bridge painting and did not know the method of estimating costs on that type of work. "It was just as reasonable for plaintiffs to conclude that the high bidder was in error as to assume that the low bidder had made a mistake."

The Utah court followed the reasoning of an eminent authority on the law of contracts, Williston, to this effect: if one innocently, and not carelessly, signs a contract through mistake, he has not given such assent to its terms as will create a valid agreement. This is so, whether or not the other party has exercised fraud over him. "But if a man acts negligently, and in such a way as to justify the other in supposing that the terms of the writing are assented to by him, and the writing is accepted on that supposition, he will be bound."

No Reimbursement for Delay

THE PROBLEM: *An airport construction contract was awarded in November by the Government, but the contractor knew that notice to proceed hinged upon clearance to be issued by the War Production Board. The contractor asked that notice to proceed be delayed until spring, because the construction season was ending, but he expected notice by April 1. Because he would be required to proceed on ten days' notice, he moved heavy equipment to the site in advance of that date. Notice was not given until late the next fall. Was the contractor entitled to reimbursement for loss resulting from idleness of the equipment during the delay after April 1?*

(Continued on next page)

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air entraining agent
for all concrete

The new 1000-bed Veterans Administration Hospital, Boston, Mass. 26,000 cubic yards of concrete, all Darex AEA concrete.

Construction supervised by: COL. H. J. WOODBURY, U. S. CORPS OF ENGINEERS
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Contractor: MCCLOSKEY & CO., PHILADELPHIA

On job after job these facts have been proved: air entrained concrete *with air content closely controlled by Darex AEA* places easier and faster, finishes better, has better surface texture, is more homogeneous and more durable when exposed to freezing and thawing. At no extra cost, ready-mix concrete plants everywhere can furnish concrete that offers you these same advantages . . . concrete made with Darex AEA. Ask your supplier, or write to us for full details.

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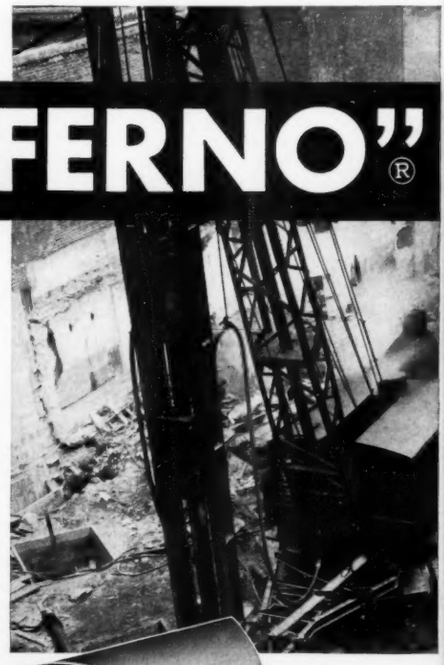
PILE DRIVER STEAM HOSE



Sizes: ½" to 2" in Maximum Lengths of 50'

"Standard of Quality"

"INFERNO" . . . the name to remember when you need hose for pile driving or any other heavy-duty steam service . . . the hose with a reputation for outstanding safety and durability under severest working conditions. A Goodall "Standard of Quality" product, recommended for pressures up to 200 lbs. and temperatures to 400°F.

The tube of "INFERNO" provides remarkable resistance to hardening and cracking under high temperatures. Tightly braided galvanized steel wires reinforce the rugged heat-resistant carcass. The tough red cover withstands hard abrasive wear and all kinds of weather. Despite its powerful construction, it has good, long-lasting flexibility.

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Est. 1870

Avoid Legal Pitfalls

(Continued from preceding page)

THE ANSWER: No. (Parish v. United States, 98 Fed. Supp. 347, decided by the United States Court of Claims.)

The Court said that the contractor proceeded upon the reasonable assumption that his notice to proceed would be forthcoming in the spring. But he proceeded at his own risk, and having been damaged by circumstances that were neither foreseeable nor attributable to the fault of either party, he must bear the loss himself."

Excavation Barricades

THE PROBLEM: *When a street contractor's men quit a day's work, they left a warning barricade around an 8-foot-deep excavation measuring 8 feet 8 inches x 10 feet 2 inches. The barricade consisted of four "horses" to which was attached 2 x 6-inch lumber. Before plaintiff's car ran into the excavation on a drizzly night, another motorist had struck or sideswiped the barricade, and plaintiff claimed that if lanterns on the barricade had been lighted then, they had been extinguished when the first motorist struck the barricade. Was the contractor's insurer liable for the plaintiff's personal and car damage, on a theory that the contractor negligently failed to maintain proper warning and barricades?*

THE ANSWER: Yes. (Moore v. New Amsterdam Casualty Co., 52 So. 2d 766, decided by the Louisiana Court of Appeal, New Orleans.)

The court said that a barricade around an excavation "should be an obstruction and actual impediment to travel, and not a mere warning". The evidence showed, the court held, that plaintiff had such control of her car as would have enabled her to stop within the range of vision ahead. She was driving only 15 or 16 miles an hour, had entered the street on a "Go" light, and had no reason to suppose that there was an excavation ahead.

Bidding Not Competitive; Taxpayers Have Right to Sue

THE PROBLEM: *A county road-bond issue was voted on the assurance that the work would be contracted under competitive bidding. But the contract was to be awarded under bidding which was competitive only as regards the contractor's fee—a percentage of the cost of materials. The contractor was trusted to secure labor and materials at the lowest possible cost. Did taxpayers have a right to sue to enjoin award of a contract under such bidding?*

THE ANSWER: Yes. (Sterrett v. Bell, 240 S. W. 2d 516, decided by the Texas Court of Civil Appeals, Dallas.)

Particularly noteworthy is the decision of the Court regarding a declaration, in an order calling a road-district bond election, that it will be the policy of the commissioners to do all construction work by contract under competitive bidding. The Court decided that this legally amounts to a compact with the voters that the contract will be so let.

After defining competitive bidding, and deciding that it did not exist in this case, the Court said that if the commissioners "could legally delegate the responsibility of buying materials, after competitive bidding to the contractor (which we do not pass upon), still there is no provision in the contract that the contractor himself must buy the materials only upon contract after competitive bidding thereon." The court also noted that there was no provision for renting equipment under competitive bidding.

Unforseeable Accident Did Not Imply Negligence

THE PROBLEM: *A pipe layer was at work in a ditch when defendant's bulldozer ran over a rock 20 or 25 feet away and snapped it against his head, fatally injuring him. Could defendant be held liable, without proof that the bulldozer was so negligently driven as to make such an accident likely to happen?*

THE ANSWER: No. (Rockey v. Ernest, 80 Atl. 2d 783, decided by the Pennsylvania Supreme Court.)

The court noted that "the accident was a remote possibility and not the natural and probable consequence of a bulldozer running over a stone."

Liability for Water Seepage

THE PROBLEM: *A company was engaged in mining gravel. Seepage of water caused by the company's operations damaged an adjacent farm. Could the company be held liable?*

THE ANSWER: Yes. (Western Indiana Gravel Co. v. Opp, 99 N. E. 2d 265, decided by the Indiana Appellate Court.)

But the Court ordered a new trial after judgment against the company, on the ground that the trial judge erred in instructing the jury concerning computation of the damages that could be awarded.

Wages Payable for Duration When Time Exceeds Estimate

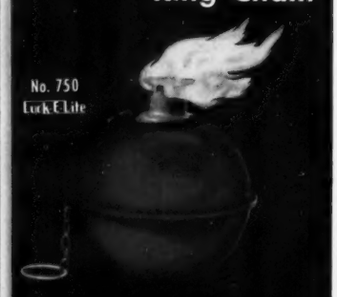
THE PROBLEM: *A contract between joint dam contractors and unions specified that established wage rates should "last for the duration of this contract . . . which is estimated to take 1,000 days or until 1949." The job was only about three-fourths finished by January 1, 1949. Were the contractors entitled to hold the unions to the agreed wage rates for the "duration", which extended considerably beyond January 1, 1949?*

THE ANSWER: Yes. (International

(Concluded on next page)

EMBURY

The Torch with the Ring Chain



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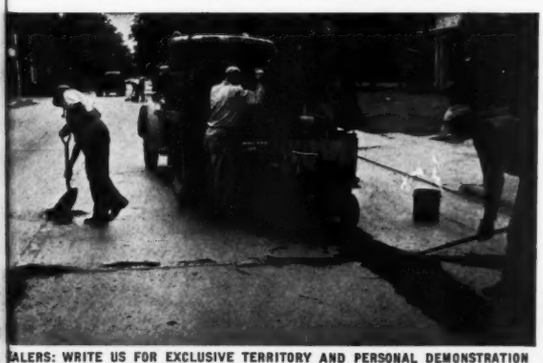
Write: EMBURY MANUFACTURING CO. WARSAW, NEW YORK, U. S. A.

EMBURY TORCHES & LANTERNS

Year-around All-Weather Patching Now Possible with

McCONNAUGHAY HOT (UP TO 300°F) OR COLD "MULTI-PUG" ASPHALT MIXER



The Patching Mixer for Summer or Winter

The best way to keep repair costs down is to repair the breaks when they first appear.

MODEL HTD

DEALERS: WRITE US FOR EXCLUSIVE TERRITORY AND PERSONAL DEMONSTRATION

CABLE: McCONN

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You can't beat DUFF-NORTON JACKS for Construction Jobs

The jacks illustrated are only a few from the Duff-Norton complete line—for every lifting, lowering, pushing or pulling requirement on all kinds of construction jobs. Jacks are available in ratchet, screw, hydraulic and air motor types—with lifting capacities ranging from 3 to 100 tons.

For complete data write for Catalog 203D.

THE DUFF-NORTON MANUFACTURING CO.

MAIN PLANT and GENERAL OFFICES, PITTSBURGH 30, PA.—CANADIAN PLANT, TORONTO 6, ONT.

"The House that Jacks Built"

Avoid Legal Pitfalls

(*Continued from preceding page*)

Union of Operating Engineers v. J. A. Jones Construction Co., 240 S. W. 2d 49, decided by the Kentucky Court of Appeals.)

Giving effect to the contract with the unions in its entirety, and in view of the surrounding circumstances, the Court of Appeals said that the estimated duration of the job should be disregarded. The Court said that a recital in the wage contract that the rates "would last for the duration of this contract for the construction of the Wolf Creek Dam", and the need for stabilizing wages on the basis on which the contractors had taken the job, required that the estimated duration be disregarded. There was also evidence tending to show that when the wage agreement was entered into, the unions desired to guard against a feared future depression in the labor market.

Federal Fair Labor Law Applied to Road Building

THE PROBLEM: *The greater part (85½ per cent) of a construction company's output of bituminous-concrete road material was used in resurfacing roads which formed parts of, or connected with, interstate highways (excluding the straightening of old road lines), and in doing industrial and railroad work for concerns engaged in interstate business. For employment purposes there was no segregation of employees according to whether their work was interstate or intrastate. Did all of the employees come under the Federal Fair Labor Standards Act?*

THE ANSWER: Yes. (Tobin v. Alstate Construction Co., 95 Fed. Supp. 585, decided by the United States District Court, Middle District of Pennsylvania.)

The Act does not cover original construction of a highway, although it is to be used for interstate travel, and there was no dispute on this point. The question was whether resurfacing a road constitutes original construction (not within the law) or repair or improvement of an existing medium of interstate commerce (within the law).

The court argued: A dirt road may be part of an interstate highway; no matter how it may be treated—whether by oiling, stoning and oiling, cementing or amesiting—it still remains a pre-existing interstate highway and not a new road.

Was Man on or off Duty When Injured in Taxicab?

THE PROBLEM: *A workman was injured after working hours when he was traveling in a taxicab to a restaurant. He was a member of a transient construction crew and was allowed a fixed sum for board and lodging. In seeking a workmen's compensation award for the injury, he claimed that he was subject to call while off duty. However, he failed to substantiate the claim. Was he entitled to an award?*

THE ANSWER: No. (Cocchio v. Condensed Service & Engineering Co., 80 Atl. 2d 455, decided by the New Jersey Superior Court, Appellate Division.)

Contractor Held Liable For Obstructing Highway

THE PROBLEM: *Motorists were injured through the presence of a dirt roadway across a paved road. The dirt road was a temporary one built by a contractor who was constructing shoulders along the pavement. The obstruction was about one foot high and two yards wide and of such color that approaching drivers would not be apt to detect it until close upon it. Was the contractor liable as having been negligent in failing to erect and maintain a suitable warning sign?*

THE ANSWER: Yes. (Eidson v. Dean Construction Co., 233 S. W. 2d 820, decided by the Kansas City, Mo., Court of Appeals.)

Engineer's Assurance Creates No Liability for the State

THE PROBLEM: *Highway contractors bought crushed-stone chips and used them on a road. The state engineer told the contractors that the seller of the chips would spread the stone after its delivery, but the contractors did not ask the seller whether spreading would be included in the price of the chips, and the seller later refused to spread them. Could the contractors hold the state liable for the extra cost of spreading the stone?*

THE ANSWER: No. (D'Angelo v. State, 106 N. Y. Supp. 2d 350, decided by the New York Court of Claims.)

"Tag Master"
"Tops" in Bucket Control

As your clamshell "flies through the air with the greatest of EASE," watch the eyes of the "sidewalk superintendents" POP!

You, too, will be delighted with the EASE with which you *cast* the clamshell, or *snub* it, or *twist* it, getting into hard-to-reach corners and picking up hard-to-manage rocks.

You'll find the tagline pull *uniform* at all bucket levels and *adjustable* to fit any job.

In addition you can use your TAG-MASTER as a *dipper-trip!*

Some of these advantages YOU NEVER HAD BEFORE . . . unless you have already used a TAG-MASTER!

For more details about this combination tagline winder and dipper trip, mail the coupon below.

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Send "TAG-MASTER" details to—

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Write for details and prices
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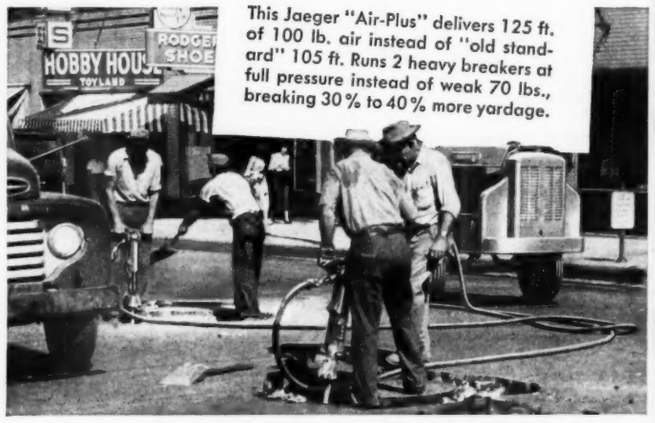
You Can Do 4 Days' Work in 3 with "New Standard" Jaeger Compressors



This Jaeger "Air-Plus" delivers 125 ft. of 100 lb. air instead of "old standard" 105 ft. Runs 2 heavy breakers at full pressure instead of weak 70 lbs., breaking 30% to 40% more yardage.

75 ft. 125 ft. 185 ft. 250 ft. 365 ft. 600 ft.

30% to 40% increases in production are yours with any "new standard" Jaeger from Model 75 that holds full pressure in a heavy pavement breaker up to Model 600 that runs 2 heavy wagon drills at full pressure with air to spare for hand-held drills. Jaeger Compressors deliver this 15% to 25% extra air at lowest cost per cubic foot of air of any compressor.

See your Jaeger distributor or write for Catalog JC-1.

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PUMPS • MIXERS • HOISTS • TRUCK MIXERS • PAVING SPREADERS and FINISHERS

America Needs Steel —and *YOU* can help!

America is sending out an urgent call for scrap! The greatly increased steel production necessary to meet today's emergency is requiring more scrap than it is getting—much more. Here's where you can play an important role. Look around your plant. Chances are, in some half-forgotten corner, there's a pile of idle, dust-covered steel scrap. Organize a salvage program . . . see that this vital material gets back to the mills. Take part in America's future—*get in the scrap!*

LACLEDE STEEL COMPANY
Producers of Steel for Industry and Construction
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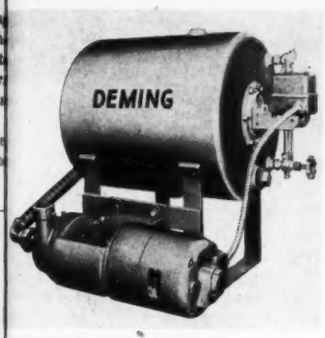


Deming Motor-Mounts help to save fuel by returning to the boiler the condensate from steam coils, radiators, or steam-operated equipment.

dded Fuel Savings For Steam Equipment

New condensation-return units announced by The Deming Co., Salem, hio, are designed to save fuel by returning to the boiler the condensate from steam coils, radiators, or steam-operated equipment. The Motor-Mount centrifugal pumps used on these units have enclosed-type bronze impellers, stainless-steel shafts, and a deep stuffing box with conventional packing rings for grease lubrication. The pump is mounted on the legs of the tank so no base is required. The motor has a standard NEMA type "C" mounting flange and is furnished for single-phase, two or three-phase, or direct current, as specified.

The condensation-return units are available in both single and duplex types. The duplex units are for conditions involving occasional demands in excess of the capacity of a single unit, or where a standby pump is desired to assure continuous operation under all conditions. Single units include pump, motor, storage tank, suction piping, Square-D float switch, and water-level gage. Duplex units include two pumps, two motors, one storage tank, one Square-D alternator switch, and one water-level gage. The 44 units available in both single and duplex types are designed to handle from 2,000 to 40,000 square feet of radiation.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 102.

Precasting Highway Bridges

Highway Research Board Bulletin No. 39 comprises a paper presented by R. B. McMinn, Senior Highway Bridge Engineer, U. S. Bureau of Public Roads, Portland, Oreg. The paper, which was sponsored by the Board's Committee on Bridges, discusses the recent rapid advances which have taken place in the use of precast members for building construction and the advantages to be found in working with such members. Photographs and diagrams are included.

Of particular interest is the application of precasting to bridges and highway structures, and Mr. McMinn cites two precasting systems: one combines precast stringers with cast-in-place slabs to form T-beam spans; the other consists of assembling precast beams and precast slabs and cementing together these structural members. Mr. McMinn also mentions recent developments in prestressing precast units.

Copies of Bulletin No. 39, "Precasting Highway Bridges and Structures", may be obtained from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. The price is 45 cents.

Left to right: Robert B. Rothschild, Jr., Bennett L. Raffin, and L. Don Weirick, partners in a new contracting firm, take a look at the map of San Francisco.

Three Are Partners In Firm's Successor

Rothschild, Raffin & Weirick, San Francisco, is a new contracting firm which succeeds the old firm of Haas & Rothschild. With the addition of Mr. Raffin, the new partnership retains the original organization and the former firm's headquarters at 274 Brannan St.

Robert B. Rothschild, Jr., a licensed engineer, was managing partner of Haas & Rothschild, and is still supervising the completion of $6,000,000 worth of construction undertaken by that firm. During the last seven years the firm has built more than $20,000,000 worth of buildings, sewage plants, canals, bridges, and many other heavy construction projects. Included in the work were such undertakings as the Sonoma State Home, the Crown Zellerbach waxed-paper factory, West Canal in the Grand Coulee area, and numerous other jobs.

Bennett L. Raffin, also a licensed engineer, has been associated with Barrett & Hilp, contractor, for the past five years. During World War II he served as Executive Officer of 2 Seabee units in the South Pacific.

L. Don Weirick was General Superintendent in charge of all construction of the old firm and has been associated with the organization practically since its start.

COMMENT
from the
BUTLER ENGINEER

December, 1951

. . of martinis, squashed olives and 6 yard Mixers

There is a Butler Bin actually in use for olive pulp storage, and if all the olives in the nation's Saturday night crop of martinis were squashed together they'd just about fill it. (Estimate *not* based on 1945 Census). Anyway, the olive pulp tycoon's problem was to get accurate indications of low, intermediate and high bin load levels. Martini load levels in the human being can be determined by direct observation — but not olive pulp in a bin.

The answer to the problem? The Butler Bin Level Indicator — an alert, sensitive but very simple device actuated by a pressure-sensitive diaphragm. Interestingly enough, it *always* works. Not only with olive pulp but also with cement, sand, gravel, coal; in fact with virtually any bin stored material. And like Mr. Wrigley's flavor — it lasts and lasts.

I'm not supposed to write advertising. I'm strictly an engineer. But I did think you'd like to know.

Here's the "Did You Know" Department: we don't make concrete mixers, but of seven 6 yard mixers which have been manufactured, six of 'em are installed in Butler Central Mixing Plants.

The point is: of the gigantic new commercial Central Mixing Plants where very high production is demanded, 6 out of 7 turn to Butler.

And the smaller fellas do too, for they've found that Butler gives them the same conscientious engineering attention.

Say, thinking about that olive pulp Bin: when they ordered the bin elevator shouldn't it more accurately have been called a bucket olivator?

See you in '52.

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

STURDILITE

The HEAVY-DUTY FLOOD LAMP THAT

Lights Your Work Better . . . Gives Longer Service at Lower Cost

Vibration-absorbing Base

Specially Designed for Efficient Service on
Shovels — Excavators — Drag-lines
Roadbuilding Equipment
Locomotive Cranes — Tractors

"BUILT to take it," say users of STURDILITE Heavy-Duty Flood Lamps, after years of trouble-free service. Hermetically sealed-beam lamp—no reflector to become tarnished. Complete assembly mounted on rubber cushioned base that absorbs vibration and shocks. Available in 6-8, 12-16, 24-28 and 110-120 voltages.

COMPLETE BULLETIN, specifications, and quantity prices sent promptly upon request.

Metal Spinning Division
PHOENIX PRODUCTS COMPANY
4727 N. 27TH STREET, MILWAUKEE 16, WISCONSIN

STRUCTO

LINE OF CONTRACTORS TOOLS
•
DEMOLITION TOOLS
•
PAVEMENT BREAKERS

All STRUCTO tools are made in the modern Arrow shops by skilled tool makers using only the finest quality steel.

In addition to the tools shown above the STRUCTO line includes air hammer tools, star drills, drift pins and pull pins. All are available in a wide variety of sizes and weights.

Every STRUCTO tool is backed by 37 years experience in making fine tools, plus a generous amount of good service to customers.

Write for Bulletin No. 851 showing the complete line.

ARROW TOOLS INC.
1900 So. Kostner Ave., Chicago 23, Ill.

Dirt Flies

A Lima shovel loads a 25-yard Euclid bottom-dump on the Guy H. James earthwork contract at Oahe Dam, S. Dak. Goodyear officials H. M. Wright (left), and Victor Holt, Jr. (right), ask Grading Foreman Patrick Stewart about the performance of the Goodyear off-the-road tires on the heavy equipment.

A spike-tooth roller of Corps of Engineers design breaks up an 18-inch lift of shale on the upstream berm of Oahe. An International TD-24 draws the roller four times over the stubborn material brought from the outlet-channel excavation ¼ mile away.

On the Campbell-Collins subcontract for the main embankment, an International TD-24 push-loads an E-2 Carryall. The units averaged five loads an hour.

With Stage 1 earthwork going on behind them, some big brass at Oahe chart progress. Left to right, J. P. Beck, Campbell-Collins Superintendent; F. A. Bleecker, Superintendent for James; and L. G. Leavitt and F. P. Evans, Area Engineer and Office Engineer for the Corps of Engineers.

At Oahe Dam

Big Equipment Works 22-Hour Double-Shift Days to Finish First Stage of Earthwork for Rolled-Fill Embankment

DIRT is being moved so fast at Oahe Dam in South Dakota that prime contractor Guy H. James finished Stage 1 — 8,500,000 cubic yards — before the target date, the end of last month.

Oahe is the second-largest dam in the Pick-Sloan plan for the development of the Missouri Valley. When completed, it will be 1¾ miles long across the top of the embankment, 60 feet wide at its crest, 4,400 feet thick at its base, and 242 feet high at its maximum. Its reservoir will extend from the dam site 6 miles north of Pierre, 50 river miles north to Bismarck, N. Dak.

Oahe's potential capacity will be 320,000 kw—more than Fort Peck, Garrison, or Fort Randall at their estimated peaks, and better than three times the power generated in the whole state of South Dakota at present. In addition to its flood-control and hydroelectric-power functions, it will provide 2,000,000 acre-feet of water annually for the irrigation of 750,000 acres in the James River Valley in east-central South Dakota. A 125-mile canal with a storage reservoir at Blunt and a power installation at Miller will carry the water.

Oahe is scheduled for completion in 1959. The Omaha District of the Corps of Engineers, U. S. Army, is directing the project.

Stage 1

Stage 1 work, which began July 17, 1950, has included 8,500,000 cubic yards of earthwork, about half overburden and half shale, for the construction of the rolled-fill main embankment, uncompacted shale berms, and the outlet-works channel on the west or right bank of the Missouri River. It included, also, a 5-mile oil-mat access road from Fort Pierre to the site (Craeger Bros. and Isaacs Construction Co. of Fort Pierre were the contractors) and a spur track parallel to the road, connecting with the Chicago & Northwestern railroad at Fort Pierre.

Prime contractor James excavated shale from the outlet-works channel and used it to build the up and downstream berms of the dam. Two 1201 Lima 4½-yard shovels with manganese-alloy buckets loaded the stubborn stuff to 25-yard Euclid bottom-dumps, which hauled it ¼ mile to the berm area. There it was spread in 18-inch lifts and broken up by four passes from a spike-tooth roller. The Corps of Engineers designed and built this roller, with 18-inch spikes, and it was used with 40,000 pounds of ballast. An International TD-24 crawler pulled it over the shale. (In muddy weather a TD-24 also served in the loading pit as a pusher for the Euclids.)

Campbell-Collins subcontracted the 2,500,000 cubic yards of overburden for the main embankment. There are four zones in this embankment, corresponding to the perviousness of four classes of material used in the fill. The upstream third contains the least-pervious silt-clay; the downstream zones are successively less pervious as the overburden deposited ranges from gravelly clay to sand and gravel.

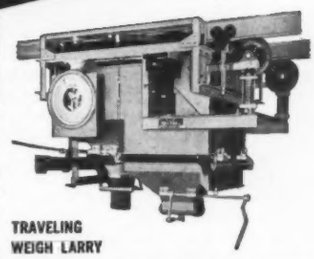
Most of the material was taken from a borrow area in the nearby hills, and hauled by 10 Model A Tournapulls push-loaded with the help of a TD-24 and a D8. Material was classified as it left the pit, and each scraper load was marked with a colored flag correspond-

(*Concluded on next page*)

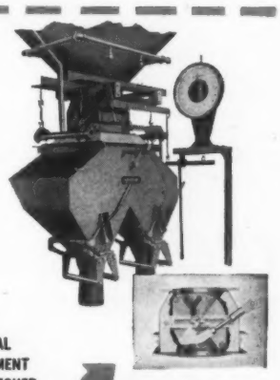
A scraper-tractor team scoops out the outlet-works channel at Oahe Dam.

Heltzel BUILDS IT BETTER BATCHING PLANTS

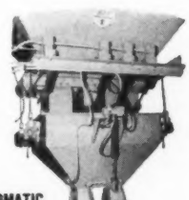
● Heltzel batchers exemplify the advanced engineering that is incorporated in **all the details** of Heltzel batching plants. Heltzel manufactures ten types of batchers specifically designed for **faster,** more accurate batching. Portable aggregate or cement plants, combination cement-aggregate plants, or circulating bulk cement plants — whichever you require, Heltzel affords you more value for each operating dollar.



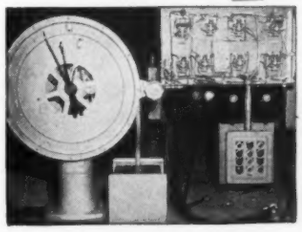
TRAVELING WEIGH LARRY

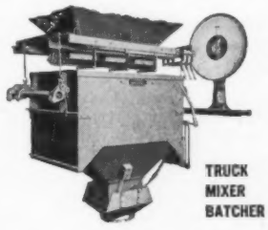


DUAL CEMENT BATCHER WITH TUBULAR CEMENT VALVE



AUTOMATIC BATCHER WITH CONTROLS





TRUCK MIXER BATCHER

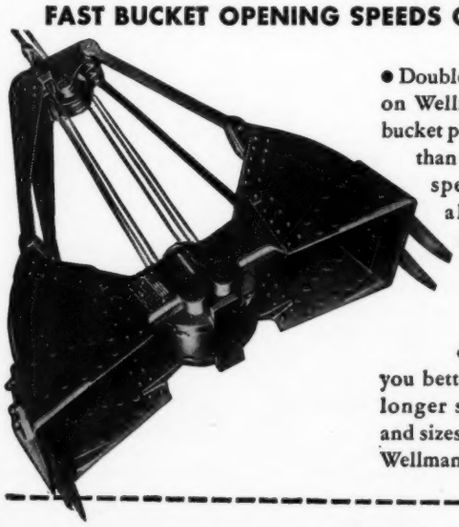
HELTZEL

STEEL FORM & IRON CO.

WARREN, OHIO

WELLMAN *Williams Type*

FAST BUCKET OPENING SPEEDS OPERATIONS



● Double-hinge construction on Wellman's multiple-rope bucket permits faster opening than a single hinge. This speeds up operations, also gives a bigger spread in the open bucket for the same headroom.

Wellman's welded-design buckets offer you better performance and longer service. In all types and sizes you'll do better with Wellman!

Want Facts? Write for free descriptive bulletins.

CLAMSHELL • DRAGLINE • CUSTOM-BUILT BUCKETS • STONE AND WOOD GRABS

THE WELLMAN ENGINEERING COMPANY
7000 Central Avenue
Cleveland 4, Ohio

The Dirt Flies Fast At Oahe Dam Site

(*Continued from preceding page*)

ing to the one for the zone taking that kind of material.

The loading run was 200 feet, with a ¾-mile haul one way down a grade averaging 5 per cent. The complete cycle was 12 minutes, and units averaged 4 to 5 loads an hour.

As the material went down in its proper zone, dozers smoothed it into 8-inch-uncompacted lifts. Then, when it was moistened, 30,000-pound sheepsfoot rollers went over it six times to give it a compaction of 90 per cent or better.

Personnel

F. A. Bleecker was Superintendent on Stage 1 for James, and J. P. Beck for Campbell-Collins. The labor force totaled 275 people, working a 22-hour 2-shift day. For the Corps of Engineers on Stage 1 earthwork, L. G. Leavitt was Area Engineer, F. P. Evans was Office Engineer, and L. R. Crist was Resident Engineer.

Structures

The dam outlet will be 100 feet wide at grade and will contain six 3,450-foot tunnels with an effective diameter of 19½ feet upstream and 18½ feet downstream. These tunnels will check discharges for flood control and navigation, and will end in a spillway basin. Gates in reinforced-concrete shafts 258 feet deep near the center of the tunnels will regulate flow. The outlet works will take 286,000 cubic yards of concrete and the channel will require 23,000,000 cubic yards of excavation.

The power works on the left bank will include six 1,700-foot tunnels like those in the outlet, each with an inside diameter of 23 feet. Some 286,000 cubic yards of concrete will go into the power works, and 33,000,000 cubic yards of excavation will be required for the power-works channels.

When the dam is completed, work will begin on the 5-mile 337,000-cfs spillway 6,000 feet west of the right abutment. Excavation for it will total 54,000,000 cubic yards of shale and overburden, and the structure will take 360,000 cubic yards of concrete.

All told, an estimated 78,000,000 cubic yards of dirt will be moved for Oahe Dam, and better than 1,000,000 cubic yards of concrete will go into it. At the peak of construction some 3,000 will be employed and the population of the Pierre area will be increased by about 10,000. Trailer villages at the site, 52 reconditioned war housing units at the Pierre Army Air Base, and more Government housing near Pierre will shelter the newcomers.

Seals Floor Surface

A resin-base sealer for wood and concrete floors has been developed by Rock-Tred Corp., 7430 N. St. Louis Ave., Skokie, Ill. Penetred is said to penetrate the surface of floors to the depths of the pores and voids, filling them with tough, binding, dyed, and colored resins. It resists the action of moisture, gases, chemicals, oils, greases, mold growth, etc.

Penetred may be applied over thoroughly clean wood or concrete floors with brush or hair broom. It dries in 4 to 6 hours for light traffic, the company claims. It is available in tile red and floor gray, and is packaged in 1, 5, and 30-gallon containers.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 129.

Data on Tractor-Shovels

A catalog on the Model HY Payloader tractor-shovel is available from The Frank G. Hough Co., 822 Seventh St., Libertyville, Ill. It contains action views of the 1¼-cubic-yard-capacity unit on construction, public-works, and materials-handling jobs. It describes features such as full-reversing transmission, operator visibility and safety, hydraulic bucket control, and power-booster steering.

This literature may be obtained from the company by requesting Catalog No. 208, or by using the Request Card at page 16. Circle No. 124.

Bulletin on Auger Bits

A bulletin on auger bits has been issued by The Midway Tool Co., Inc., Melvin, Ohio. It describes Mirbrite bits for hand braces, available in 17 sizes ranging from 5/16 to 2 1/16 inch. It lists 5 to 6-piece and 13-piece sets packed in sturdy plastic rolls, and gives information on electric-drill bits, screw-driver bits, etc.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 114.

Frank T. Sheets Dies

Frank T. Sheets, President of the Portland Cement Association, Chicago, Ill., died on November 3.

Mr. Sheets joined the organization in 1933 and served as consulting engineer and director of Development until his election to the presidency in 1937. In 1940 he was instrumental in bringing about a long-time study of cement performance in concrete under varying conditions of climate, soil, and water. The building of the $3,000,000 PCA laboratory was another outcome of his leadership.

Mr. Sheets' early professional life was spent in Springfield, Ill., where he was associated with the Illinois Division of Highways both before and during his college days. After graduation he entered the Highway Department and worked his way through successive posts to be Superintendent of Highways and Chief Engineer.

Mr. Sheets served at various times as President of the American Association of State Highway Officials, of the Mississippi Valley Highway Conference and of the Central Illinois Section of the American Society of Civil Engineers.

On U.S. 41—Wisconsin—Courtesy Roads & Streets

. . . AND AT 200 TONS PER HOUR

Here is a typical shoulder building job—clean, fast, eminently satisfactory. Works wonders in keeping costs down, too!

This APSCO Widener puts down shoulders up to 10′ wide or concrete in 2′ to 6′ strips—*without forms!* It's truly versatile!

It is understandable that a large percentage of all mechanized road widening in recent years has been done by APSCO equipment. Contractors report that it has paid for itself—many times over.

For more detailed specifications on APSCO wideners, Base Pavers, Trench Rollers or Bituminous Paver Finishers, write to the company.

ALL PURPOSE SPREADER CO. Elyria, Ohio U.S.A.

CURBS are Important Too . . .

This PAVER is WISCONSIN-Powered!

Paving five linear feet a minute is the record of the Dotmar Paver . . . an unusual unit built by Dotmar Industries, Inc., Kalamazoo, Mich., and powered by a Wisconsin Heavy-Duty Air-Cooled Engine.

But there is nothing unusual in this manufacturer's choice of Wisconsin Engine power. Wherever you travel, you'll find Wisconsin-powered equipment at work . . . as power plants of mixers, vibrators, hoists, concrete carts, and many, many other machines. Timken tapered roller bearings at both ends of the crankshaft, your assurance of absorption of all thrusts, and an easily-serviced OUTSIDE magneto with impulse coupling for any-weather starting and running, are two of the engine's many heavy-duty features. Air-cooling, eliminating cooling problems, is another. You get many hours of steady running for every few minutes lost in "shut-downs" due to fueling and minor servicing.

Write for details. 4-cycle single-cylinder, 2-cylinder and V-type 4-cylinder models, 3 to 30 hp.

WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 46 WISCONSIN

MC Self-Raising Tower-Hoist

THE INDUSTRY'S MOST VERSATILE

- Picks itself up • Easily extends
- Lifting heights up to 94 feet
- Single or Double Drum Hoists
- Platform speed—100 ft. per min.
- Lifting capacity—2,500 lbs.

Optional Equipment: **Gin Pole Assembly, "Chicago" Boom, Tip-Over Bucket, Truck Mounting, Interchangeable 10′ Extensions.**

CONSTRUCTION MACHINERY COMPANIES
WATERLOO, IOWA

☆ Let Your Dollars Fight Polio ☆

Tractor-Mounted Trencher

ew literature on the Mobile Trench- factory-mounted on the Minneap- -Moline RTI tractor, is available n Mobile Trencher Co., 140 W. Ma- Monrovia, Calif. It points out that unit will dig trenches 12 to 18 es wide to a maximum depth of inches. The tractor has 14.00 x 24 s and is capable of road speeds up 7 mph.

he trencher is designed for work on ndation ditches, sewer lines, septic k and drain lines, pipe, and utility allations. Spoil is cast to the side may be backfilled with the dozer front-mounted on the trencher. The bulletin illustrates the unit in operation and gives specifications.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 140.

Heavy-Duty Trailers

A broadside on heavy-duty trailers for use in the construction industry has been prepared by Birmingham Mfg. Co., Inc., P. O. Box 2838, Birmingham, Ala. The complete line illustrated in the catalog has a range in ton ratings from 11 to 50. Platform lengths range from 15 to 22 feet. All units have an over-all width of 8 feet. The axle mountings on the various models differ: fixed axle, trunnion bearing, tandem assembly, rocker beams, and walking-beam types. Some of the more common models are illustrated in the literature.

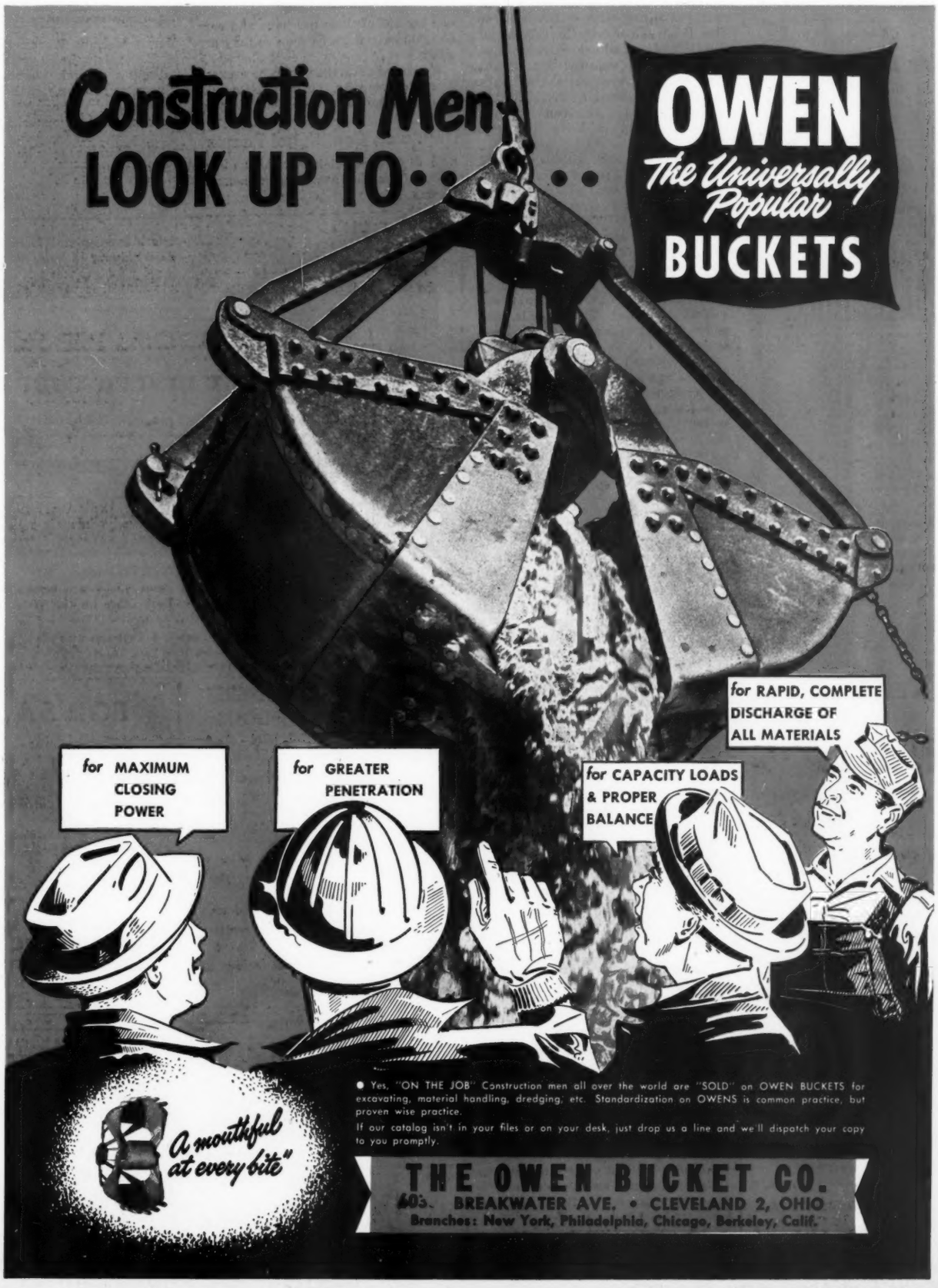
The company points out that all frames on the Birmingham trailers are electrically welded and designed with an ample factor of safety. The low-bed trailers are surfaced with car-stock oak decks. Other features include Bendix Westinghouse air brakes, rear loading ledges, and lashing rings.

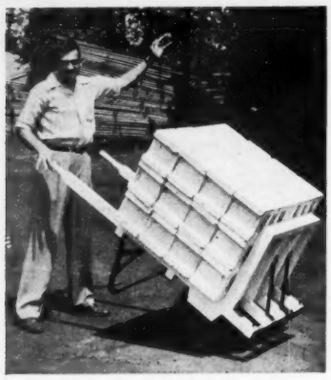
This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 166.

Seals Off Wall Leaks

Flextite is a liquid chemical which can be mixed with cement, or cement and sand, to produce a mortar that seals off leaks and water seepage in concrete walls. It is easy to handle and fast-setting, and is recommended by its manufacturer, Flexrock Co., for plaster-coating walls above or below ground or water level and for pointing up spalled areas.

Further information may be secured from Flexrock Co., Filbert and Cuthbert, West of 36th St., Philadelphia 4, Pa. Or use the Request Card at page 16. Circle No. 118.


Construction Men LOOK UP TO . . . .
OWEN
The Universally Popular
BUCKETS
for MAXIMUM CLOSING POWER
for GREATER PENETRATION
for CAPACITY LOADS & PROPER BALANCE
for RAPID, COMPLETE DISCHARGE OF ALL MATERIALS
"A mouthful at every bite"
● Yes, "ON THE JOB" Construction men all over the world are "SOLD" on OWEN BUCKETS for excavating, material handling, dredging, etc. Standardization on OWENS is common practice, but proven wise practice.
If our catalog isn't in your files or on your desk, just drop us a line and we'll dispatch your copy to you promptly.
THE OWEN BUCKET CO.
605 BREAKWATER AVE. • CLEVELAND 2, OHIO
Branches: New York, Philadelphia, Chicago, Berkeley, Calif.

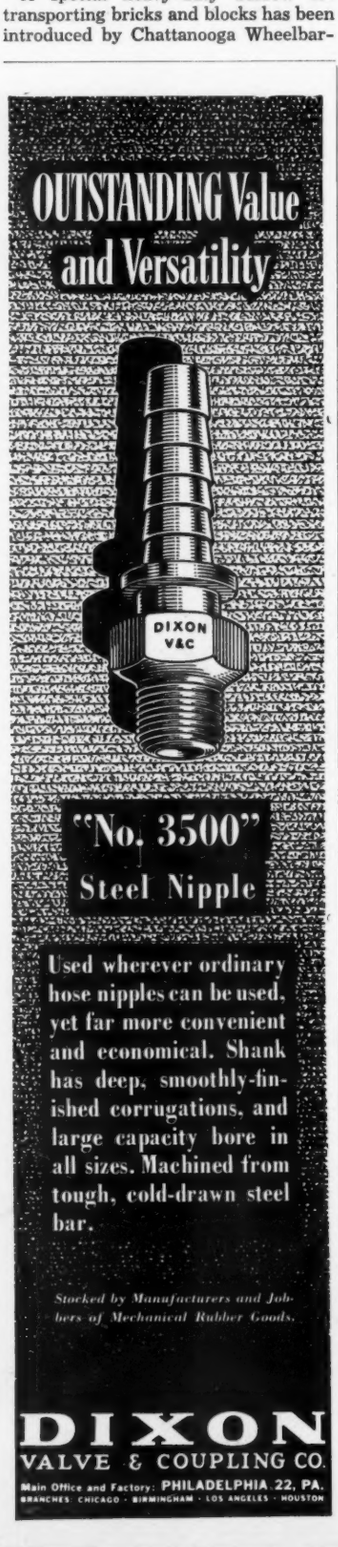


Dual Wheels, toed in, permit short turns with this heavy-duty Chattanooga barrow for transporting bricks and blocks.

Heavy Block Barrow

A special heavy-duty barrow for transporting bricks and blocks has been introduced by Chattanooga Wheelbarrow Co., 1311 E. Main St., Chattanooga, Tenn. Dual wheels, toed in, permit short turns. The No. 49 block barrow is manufactured from seasoned hardwood and is available with 4.00 x 8 two or four-ply tires or 16 x 4.00 zero-pressure tires. The company points out that a 24-block load weighing 600 pounds puts only 50 pounds of weight on the man wheeling the barrow. Bed size on this unit is 24 x 31 inches.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 137.


OUTSTANDING Value and Versatility
DIXON V&C
"No. 3500" Steel Nipple
Used wherever ordinary hose nipples can be used, yet far more convenient and economical. Shank has deep, smoothly-finished corrugations, and large capacity bore in all sizes. Machined from tough, cold-drawn steel bar.
Stocked by Manufacturers and Jobbers of Mechanical Rubber Goods.
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Main Office and Factory: PHILADELPHIA 22, PA.
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Splicing Conveyor Belt of Steel Cable

A new method of splicing steel-cable conveyor belting has been developed by The B. F. Goodrich Co., Akron 18, Ohio. It places all cables under equal tension during vulcanization so that each cable carries its share of the load in the finished splice. The new method is also said to permit a straight splice, resulting in belts that track straight.

To make the splice, cable ends are cut in a staggered pattern. Small tubular connectors are placed over the butted ends. Connectors are first given a light crimping. The partially made splice is then stressed to even the lengths of the cables, and connectors are given a final crimping to lock them to the cables. Rubber and fabric removed for the splice are then rebuilt around the cables. The splice is cured under tension with a conventional vulcanizer.

The tensioned splice can be made in the field as well as at the factory. Special tools needed are a crimping device for squeezing the connectors to anchor the cable ends, and a scraping tool to remove rubber from the cables.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 179.

Equipment Degreaser

A compound designed for everything from heavy-duty degreasing to plain truck washing is made by Stewart-Hall Chemical Corp., 550 S. Fulton Ave., Mount Vernon, N. Y. Super Greasemaster is diluted with 3 to 8 parts of kerosene or light fuel oil for most applications. It is sprayed or swabbed on in the desired concentration, allowed to stand for 15 minutes, and then hosed off. The company reports that when used according to directions, the compound does not harm paint.

A hydraulic hand-operated spray gun or a specially designed air gun is given free with the initial order of a 55-gallon drum, the company says. The product is also available in smaller containers. Super Greasemaster is offered on a 30 day "get acquainted" trial plan.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 106.

Hard-Facing Alloy Rods

Five new bulletins covering its complete line of hard-facing alloy rods have been prepared by Alloy Rod & Metal Division, Victor Equipment Co., 11320 S. Alameda, Los Angeles, Calif.

They provide information on Victor Tungsmooth, a fine-mesh tungsten carbide rod, and Victortube, a tungsten carbide rod, both for electric or acetylene application. They also cover Victoralloy, a fabricated rod which contains alloys in a tube, has a high alloy coating, and is designed to resist abrasion and withstand severe impact. The bulletins include on-the-job illustrations, describe applications and features, and list sizes.

These bulletins may be obtained from the company, or by using the Request Card at page 16. Circle No. 193.

New Street Markers

New Tenite plastic street markers are manufactured by the Traffic Safety Supply Co., N. E. Sandy Blvd. at 27th, Portland 12, Oreg. According to the company, they are quick and easy to apply to any type of street surface and need no further attention, once they are down, during their 4 to 6-year life.

Dur-O-Line markers are saucer-shaped disks 4½ inches in diameter and are designed to withstand 63,000-pound pressure. They are solid in color all the way through and are available in traffic yellow or dead white. Wear does not dull their original brightness, the company says. They are usually spaced about 2 feet apart to make a well defined traffic lane. Two average workers can lay 100 of them per hour and cars can run over them as soon as they are down.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 175.

Dur-O-Line plastic street markers can be applied to any type of road surface and last 4 to 6 years. They come in traffic yellow or dead white, and need no repainting during their lifetime.

Data on Centrifugal Pumps

A 6-page pocket-size folder on centrifugal pumps has been issued by Morris Machine Works, Baldwinsville, N. Y. It lists the functions, sizes, and capacities of each Morris model, and illustrates it. Some of the pump types included in the catalog are double suction, sand, material - handling, dredge, and slurry pumps.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 185.

There's Always a **BEST WAY**

That goes for snow clearance, too. It's no mere accident that

DAVENPORT-FRINK SNO-PLOWS

enjoy engineer-preference throughout the snow belt. They have won their spurs through Faster • Safer • Cleaner Snow Removal.

PLAN AHEAD

The best time to think about increased efficiency for next year is NOW. We'll gladly supply complete information.

ALL SIZES and TYPES for TRUCKS • TRACTORS • MOTOR PATROLS

DAVENPORT BESLER CORP.

Dept. A Davenport, Iowa

Made in Eastern U.S.A. by FRINK SNO-PLOWS, INC., 1000 Islands, CLAYTON, NEW YORK

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470 Fourth Avenue, New York 16, N. Y.

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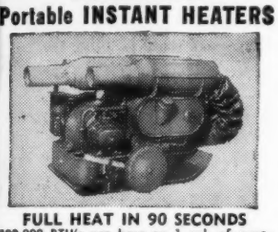

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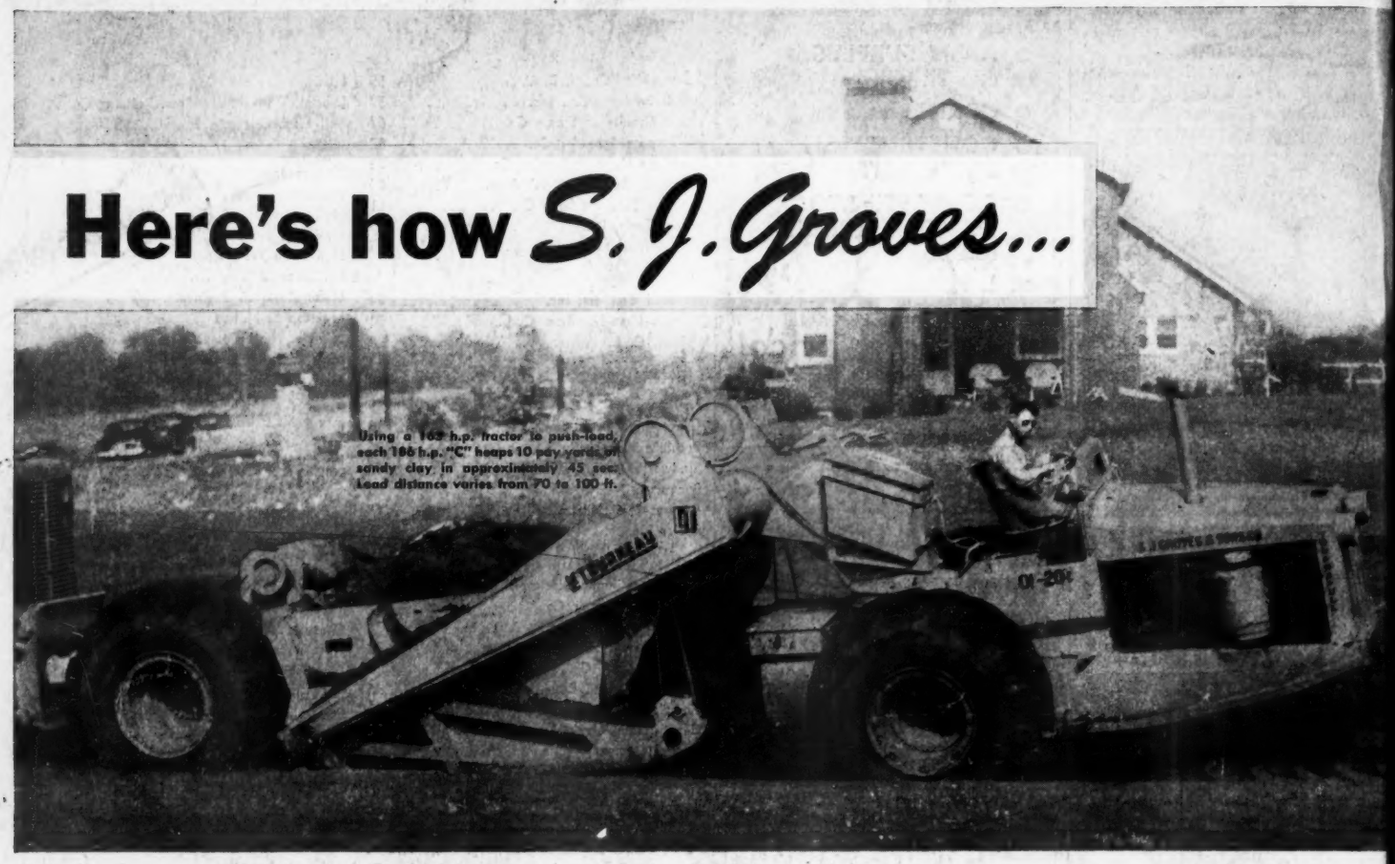

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